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**PROGRAM AND ADMINISTRATION**

**by**

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PROGRAM AND ADMINISTRATION

	<u>Page</u>
A. Foreword .....	1
B. The Plan of This Memorandum .....	2
C. Comments	
I - Types of Possible Support .....	3
II - Procedures of Choice .....	10
III - Field or Fields of Special Interest ....	16
IV - Checks and Reviews .....	16
V - Officer-Trustee Relations .....	18
VI - Interdivisional Relations .....	19
D. Principles and Recommendations .....	21

A. FOREWORD

Since this memorandum is the response to certain broad questions, it is important to note at the outset what topics are here considered, and what topics have been excluded. Assuming that The Rockefeller Foundation is going to support research in the natural sciences over a period of years at approximately the present level, what is the wisest and most useful program, and what are the most effective administrative mechanisms? These are the questions which are here discussed. But underlying these are two more basic questions neither of which is here considered. Thus this memorandum does not ask: why should the Foundation support research in the natural sciences, and how large should such support be in comparison with expenditures in other fields? From the record of the various boards it is concluded that the trustees have no doubts concerning the desirability of support for science. If a change of this policy is under consideration, so grave a decision should be influenced by the scholarship of the world, rather than by the somewhat fortuitous effectiveness of the presentation of any one individual.\* Arguments on the optimum relative size of natural science support are not presented here, on the assumption that

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\* It may, however, be mentioned that I wrote, shortly after being appointed in 1932, a memorandum under the title "The Values in Science". This was not written to convince anybody of anything; but simply because I could not have satisfaction in a job unless I had thought through for myself the reasons why it seemed to me worth while.

this trustee question is one which an individual director cannot properly discuss, even in a memorandum of this character.

B. THE PLAN OF THIS MEMORANDUM

What sort of support should the Foundation give to the natural sciences, and what administrative procedures seem likely best to serve both the necessary practical interrelationships of scientists, officers, trustees, and public, and also the imponderable broader relationships between scientific progress and the welfare of man? These questions may be come at from a variety of directions. Certain directions of approach reveal possibilities which obviously do not square with the special potentialities of the Foundation. But even though these possibilities may seem trivial or impractical, it is as well to include them as partial insurance that one is trying to look broadly at the problem, not too much influenced by tradition.

There are interlocking connections, moreover, between the various ways of coming at these questions, so that it is difficult to know where to start and what plan of exposition to follow. And what is sought here is not a logical\* idea, but a practical compromise, controlled not only by the aims of pure science and the useful service of men, but also by the limitations of funds, the human peculiarities

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\* Science occupies its present prestige and power because it has learned the hard lesson that logic which may be a good servant is always a bad master." L. Hogben

of scientists and institutions, the exigencies of the days in which we live, and the finite wisdom and energy of officers and trustees. It is relatively easy to compose a well-ordered exposition of certain grand ideas; but one experienced in the actual day by day business of a foundation would find it necessary to punctuate such an idealistic document with a series of rude but practical considerations.

Thus a large number of considerations crowd into this problem some of which have little significance apart from the whole complex of other considerations. It has therefore seemed advisable to present first, with no special attempt to trace interrelationships, a frankly heterogeneous series of fragmentary topics, labeled "Comments". With that section of comments on record and in mind, the concluding section of "Principles and Recommendations" can, it is hoped, combine briefness and intelligibility.

### C. COMMENTS

#### I - Types of Possible Support

##### A - Recruitment and Development of Personnel

##### 1 - Discovery of and aid to "young genius"

The "Lincoln Stiftung" sort of thing - somewhat appealing but too chancy - too great wastage - boy wonders often burn out early - better left to more emotional organizations.

##### 2 - Undergraduate and graduate scholarships

Some objections as above - procedures of wise choice lacking.

### 3 - Training fellowships

As now used to serve program - special emphasis on broad training in disciplines auxiliary to but correlated with main interest - of special service to "borderline" fields such as biochemistry and biophysics - very high standards of choice essential - of high importance and usefulness if Foundation is following a functional program with fields of concentration.

### 4 - Experience fellowships

Also as now used - candidates in general more mature and with established competency in chosen field of research - to furnish an enlivening experience through first-hand contact with the men, problems, and techniques of other groups - values clearly demonstrated by several years of experience, particularly in Europe - of high importance.

### 5 - Special fellowships

Characteristically given to still more mature and distinguished men - infrequent but very useful.

### 6 - Cooperative fellowships

Costs shared between foundation and institution - to protect research interests during first critical years - automatically limits appointments to men who have positions and every assurance of continuing research opportunities - a type of fellowship that has been too little used.

### 7 - NRC fellowships

Essential part of a broad program - also highly desirable backlog of general development in science as an adjunct to a concentrated program - protection against charge of over-direction of American science by Foundation - universally recognized as one of the best and soundest things the Foundation has ever done in science - method of selecting candidates has been improved - support has been too far reduced.

## B - Support for Individual Scientists

### 1 - Salaries for research professors

Should be, and in practice is, the obligation of the university - not advisable and not necessary, but see below under Departmental Development.

### 2 - Expenses for summer travel and research of individuals.

Frequently asked for this - almost uniformly a poor thing to do.

### 3 - Personal research budget for outstanding leader

Differs from support of a one-man "project" in that here the money is pledged for the recipient's general ( and perhaps changing) interests - emphasis almost wholly on the man, and very little on problems - ideal when it is really justified - Cannon fine instance - Stockard doubtful case - one is playing at rather long odds for high stakes - only rarely does a man have the qualities of character and intellect that keep him highly productive over a long period - ample sums have been known to remove a great experimenter from the laboratory and make him a director of lesser abilities - this is a procedure to be used with great caution.

### 4 - Assistance for specific problems or programs

See G - Project Support; also II, A.

## C - Group Support

See G - Project Support, for a project often involves a cooperating group - here is meant the support of a group working in one institution on separate problems which, as a group, fall within program interests - Chicago biology and Stanford biology good examples - procedure open to dangers mentioned under L - Fluid Research Funds - justified when the administration of the funds is under direction (Taliaferro at Chicago, Taylor at Stanford) which insures against these dangers - closely related to departmental development as listed under E.

#### D - Committee Support

Example is NRC Committee on Sex Research - at its best, a way of mobilizing the brains of the country for attack on a set of problems - personal and institutional connections of committee members are handicaps to their objectivity and freedom of action - vested interests develop surprisingly rapidly - in general such committees should not continue too long, for they inevitably enter period of diminishing returns - good tactics in "public relations" aspects of science program.

#### E - Departmental Development

This heading overlaps with several others, since assistance to a man or group obviously strengthens a department - here is meant a move planned primarily to develop future and permanent departmental strength - aid might consist of funds for equipment and supplies, laboratory construction or alteration, research assistance, temporary aid to major salaries later to be assumed by the institution, fellowship training and experience for staff, etc. etc. - such items will in general involve substantial sums - this is building permanently for the future.

#### F - Institutional Development

This still broader category would involve the departmental development of a group of science departments in an institution - obviously "broad" support, and would involve large sums.

#### G - Project Support

Emphasis so far in this list has been on men, groups of men, and institutions - "Project Support" involves no less emphasis on the quality of personnel, but adds to this an emphasis on the special program interest of the project or problem in question - support may consist of

##### 1 - Grants in aid

Relatively small and of short term - allocated by officers - important exploratory and tryout mechanism - aid to returned fellows - fine way of maintaining intimate contact with men and problems - time-saving for trustees and administration - other agencies can

admittedly do this sort of thing, but this is no reason why we should refrain if the procedure really is useful to us - disappointing unless the small grants really add up to a total result of recognizable coherence and significance - this leads one to bar, at least for the Foundation, general grant in aid programs, and use this only as a mechanism to serve special program interests - must be administered with restrained objectivity to guard against the lure of that power and prestige which sometimes goes with being Santa Claus.

## 2 - "Docket Item" Projects

From two to five or more years in extent, and from two to ten or fifteen thousand dollars per year - usually under the direction of one or two scientists - characteristically provide equipment, supplies, and research assistance - results are concrete and can be fairly accurately appraised - decisions must involve, within the recognized range of field, primary emphasis on quality of personnel - the backbone of a concentrated program.

## 3 - Cooperative Projects

Present NS program, with special interest in applying the techniques and methods of the physical sciences to problems of biology, has found an unanticipated number of worthwhile opportunities to assist in the active collaboration between biologists, on the one hand, and chemists, physicists, or mathematicians, on the other. - such research, escaping the traditional organizational formulae of most institutions, in particular need of outside assistance - cooperation is a tender plant which will stand no forcing - but it deserves all the light, air, and nutriment that it can spontaneously absorb - NS is proud of some of the examples we now have on our books.

## H - National or International Scientific Organizations

### 1 - National Research Council

The master organization of American science - can not be neglected, certainly should not be antagonized - at times a most desirable buffer between the source

of funds and recipients - best and safest agency for getting various things done - deserves general support.

## 2 - Internationally Organized Scientific Efforts

Examples are International Critical Tables, International Polar Year, International High Altitude Station on the Jungfrau, International Biological Station at Naples - important as examples of sane international cooperation - deserve support - very modest part of funds at present supplied to NRC can be used for such purposes.

### I - Buildings

Under present conditions major expenditures under this heading should be a rare exception - certainly no situation of general need that justifies particular attention here.

### J - Endowment

Necessarily broad support - to be significant, involves very large sums - not a natural part of a program in which considerable emphasis is placed on certain chosen fields.

### K - Support of National or International Conferences, Colloquia, or Congresses

To recognize any general interest in such activities would seem inappropriate - to take too active a leadership in organizing such meetings is unwise - it is also a very easy and pleasant way to waste money - special cases warrant exceptional treatment.

### L - Fluid Research Funds for Institutions

Blanket sums turned over to institutions from which they allocate for special projects - such funds vital to the research spirit of an institution, but highly doubtful if this is wise business for the Foundation - money characteristically dissipated in many small projects ranging from excellent to foolish and bizarre - chief objection is that decisions are influenced by a variety of institutional criteria that have little objective validity - a good way

to make an institution happy, but not so good a way to serve science - probably never warranted except when a start by the Foundation will stimulate state or other sources to carry on.

#### M - Publications

A pit into which we could pour all our funds and never even hear them hit bottom - general support not warranted - exceptions justified in truly remedial cases as where, for example, modest support will aid in allocating the costs of publication of research where they belong, as an integral part of the cost of research - the support of physics and mathematics publications in this country has been stabilized in this way under Foundation help - should also help, when opportunity offers, competent experimentation or planning that is aimed at a real solution of the world problem of publication, distribution, storage, and cataloguing, indexing and abstracting research publication in all fields (microphotography, for example).

#### N - Research Institutes

##### 1 - Independent Research Institute

Independent building, staff, and endowment for, say, "Genetics" or "Endocrinology" - requires huge sums - the day for this (even in the judgment of those who favor the idea) would appear to be at least temporarily past.

##### 2 - Marine Biological Laboratory Type

Requires building and endowment, but no permanent staff - serves as focus for graduate teaching and research interests of nationwide (and international) group of summer visitors - needs of this type appear, fortunately, to be already met.

#### O - Endowment

The present burden of proof against permanent endowment of any activity seems to be justified.

#### P - Expeditions or Explorations

Usually appeal to other sorts of sources - involve serious risks for such an institution as the Foundation - not indicated for Foundation interest.

#### Q - Scientific Museums

Also appeal to other sources - usually mild scientific interest or importance - not indicated.

#### R - Scientific Prizes

Of very questionable value to scientific progress - certainly not for the Foundation.

#### S - Other Types of Support

No list can be complete enough to catalogue all future possibilities - the drosophilists of the world wanted a small sum for maintaining a clearing house for current research news and a central supply service for all stocks of fruit flies - this opportunity to aid genetics was important, but was also essentially unique in character - aid to deposed scholars - there will be other unpredictable items.

### II - Procedures of Choice

#### A - Men versus Problems

The most precious commodities that a foundation can deal in are brains and character. An important problem seldom if ever makes a little man great, while one of the characteristics of a great man is his ability to discern and attack great problems. Thus the choice is a clear one. But it is misleading to leave the matter here, lest one conclude that this choice is one which frequently confronts an officer. If one concentrated all the resources of the division in a grimly determined effort to force advance in some narrow field, then one might well be required to put emphasis on problems ahead of emphasis on men. But the area now included in NS program is much too broad to lead to any such dilemma. Working within our area, and placing primary emphasis on quality of men, the opportunities still greatly exceed our resources.

## B - Add to the Strong or Build up the Weak?

This question sometimes occurs in Foundation discussions. Building up the weak is a type of general developmental operation that is not consistent with the present ruling philosophy of concentrated emphasis. But it is sometimes very important to add to the otherwise strong or the potentially strong; and it should be observed that this alternative seldom faces one in the administration of a concentrated and functional program. Seeking to serve certain program ends, one simply siezes his opportunities where he finds them. In a majority of instances they are of course found in strong institutions, but it would be foolish to disregard the special competence sometimes found in small institutions. The best man in America in one branch of physical chemistry is at Amherst, one of the two specialists on producing pure amino acids is at the Univ. of Southern California, a leading enzyme chemist is at the German Technical High School at Prague, a world authority on the genetics of the primrose is at Goucher College, etc. etc. etc.

## C - Small or Large Projects?

This topic has been discussed at some length in WW's previous memorandum of November 5, 1936 on "The Case for Small Projects". In particular, this memo gives the actual facts of distribution in size of NS activities over various periods of time. Only the following summary comment will be included here.

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In the last analysis the dollars of the Foundation do very individual jobs: some buy a piece of equipment; some pay a railroad fare; some buy bricks; some pay a man's salary for a year; some purchase glassware, chemicals, experimental animals, etc. etc. But one continuously hopes that these individual expenditures are fitting together to serve certain broad purposes; one hopes that all these individual activities add up to some result of real significance. Indeed our trustees cannot long continue support for a program unless they can sense the synthesis which gives cumulative significance to the individual expenditures.

How is such a synthesis to be achieved? In the case of the very large projects of the past the concentration of a major expenditure in one place itself contributed to a sense of significant unity. If the trustees

wish a highly concentrated functional program, they must recognize that concentration of effort, at least in certain fields, strongly influences towards smaller projects; and they must be prepared to make a special effort to utilize means whereby one might test whether or not the separate moves fit together into a consistent, a unified, and a significant pattern. See Comments, Section IV Checks and Reviews and Section V Trustee-Officer Relations.

#### D - The United States and Europe

Under present conditions there is little in the natural sciences that can wisely be done in Germany, less in Italy, still less in Russia, and still less (zero now having been reached) in Spain. Opportunities are attractive in England, Denmark, Sweden, France, Switzerland, Holland, Belgium. Worthwhile opportunities occasionally arise in Hungary, Czechoslovakia, the Baltic countries, Yugoslavia, etc. The proportion of NS funds used in the United States seems bound to be higher, over the next few years, than in the past. But we have, it seems to me, an important opportunity and duty to remain calm and uphold, wherever and whenever we can, the hands of rationalism, decency, and sanity. Science (and particularly biology, so far removed from the technologies that can be used to destroy men) is about as safely, as healthily, as unselfishly international as is any human activity. I strongly believe that, as the number of opportunities in Europe decreases, the strategic importance of each is likely to increase in a compensating way. I strongly believe that European activities should be limited by no special decision to reduce or withdraw, but simply, as in the past and everywhere, by the application of normal criteria.

#### E - Equipment, Supplies, Research Assistance, Buildings?

From the point of view of general policy these are meaningless alternatives. One could as well ask whether an ailing man needs rest, exercise, an operation, or a physic.

#### F - Start New or Finish Old?

The Penrose fund of the Geological Society of America has (or at least did have) a rule that they would give support only for the completion of projects judged to be at least half done. Perhaps a desirable safety measure for a small fund, this criterion seems to have no general value for the Foundation.

## G - The Present and the Future

Agreeing wholeheartedly that a chief aim of science is the service of men, it is nevertheless my own conviction that recent discussions reflect too great an emphasis on present recognizability of practical importance\*. Prof. L.Hogben, in his essay on The Retreat from Reason, has said: "The only valid distinction between pure and applied research in natural science lies between enquiries concerned with issues which may eventually and issues which already do arise in the social practice of mankind." The most practical technique of biology and medicine ten or twenty or forty years from now may rest upon the most impractical-appearing present discovery in organic chemistry or even in pure mathematics or atomic physics. The immediately and obviously applicable will get done somehow, by other aid if not by ours. We should have the courage, the patience, and the vision to devote a sizable fraction of the Foundation's resources to the playing of the greater, longer, game.

## H - "Just do the best things"

To characterize by so unfairly naive a phrase certain beliefs concerning Foundation procedure is to lay oneself open to the charge of attacking a dogma with a stigma. And yet this phrase does summarize certain reactions against definitions of program and against specifications of procedure. Some persons appear to think that stated policies and systematization of administrative mechanisms are merely the protective devices of a small and over-tidy mind, not brave or wise enough to make its own decisions.

Indeed everyone wants to do the best things, but by what criteria is a project to be judged best, and what assurance is there that all of the strongest alternatives have been given due consideration? I react strongly against any assumption that the best opportunities for support spontaneously rise to the surface and magically drift down forty-ninth street, where they may be skimmed off and presented to the trustees. I suspect that the NS

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\* "It does not pay to tether one's thoughts to the post of usefulness with too short a rope." John Dewey ..... "There is nothing so prolific of utility as abstractions." Faraday.

division has been considered too fond of careful diary records, too much concerned with detail, too little devoted to general strategy. The nature of the early explorative years of our new program, and the directions we have had from the trustees, have both pointed us toward relatively small projects, and have doubtless contributed somewhat to this impression. But for the labor that has gone into all this detail I make no apology. I am convinced that it is an essential basis for general strategy. I maintain that there is no decision, large or small, which does not ultimately rest on the accuracy and objectivity of such detailed information.

Do the best things, of course! But be realistic about the means which are necessary for assuring a fair approximation to that end. The Foundation, whatever may be the case for smaller organizations, does not need to depend upon uninformed enthusiasms or upon personal or emotional appeals; has no right to depend upon chance, or succumb to the smoothly organized attacks of the good askers who know the ropes; has no right to handicap the distant or the modest. Although I am necessarily getting ahead of my story in so doing, I stop here to indicate that these remarks connect closely, in my mind, with the following statements:

- (a) The Foundation owes it to the world of scholars to make plain and definite what its program is.
- (b) It should not make exceptions to declared program unless it frankly indicates, in the program statement, the possibility of such exceptions.
- (c) Within its special program interests, the Foundation has an obligation to be informed in such a way as to bring to the very serious duty of making each decision a background, both broad and detailed, of knowledge of men, problems, and alternative opportunities.
- (d) The extensive information and the detailed competence that, within special program, should reasonably lead to "the best" cannot (at least with a

staff of present size) be similarly brought to bear on broad program or on exceptions to special program. Therefore if such sections of program form a recognized part of Foundation activity, special techniques, special protective devices must be adopted to insure as fair, as objective, and as wise as possible a procedure of choice. See Recommendation VIII.

## I - General and Special Program

There is no intention of arguing at this point the strong and weak points of concentrated or general programs. This topic is included here under the general heading of "Procedures of Choice" because the nature of the program - whether general or concentrated - inevitably affects the procedures which ultimately lead to officers' decisions to recommend. These remarks are, moreover, very closely connected with those made under the preceding subhead.

There are two main considerations. What procedures of choice are financially and administratively practicable, and what procedures promise the broadest, most objective, most open, and fair competition between all possible recipients of support? The nature of the program affects, in my judgment, the answer to both of these questions. There is a procedure which (whether the most efficient or not) is at least logical and socially fair for the administration of a totally general program. The program is widely announced as such, every person has a reasonable chance of knowing that it is proper for him to present his case, and the officers and trustees draw as widely as possible on competent advice, cross their fingers, and do their best. This best probably cannot be defended, but it is equally true that it cannot effectively be attacked. Similarly, there is a logical and fair way to administer a concentrated program, - a way which I consider to be not too far removed from the one in use at present. But it is a tricky and difficult business to try to drive two such programs in tandem.

Theoretically there would appear to be little difference between two programs, one consisting of special plus exceptions, the other consisting of special plus general. But practically I think there is a real difference in officer's attitude, in administrative procedures, and in

Foundation - public relations. The first is open to a variety of human dangers that the second could be made free from. See Recommendation VIII.

### III - Field or Fields of Special Interest

Five years ago there was recommended, as the special interest of this division, the support of researches planned to increase knowledge concerning the functioning of living organisms, - a program in vital processes. There was recommended, moreover, a particular interest in increasing the application to basic biological problems of the analytical procedures and the experimental techniques of chemistry, physics, and mathematics. In the intervening five years there has been the world over a markedly growing interest in such research; leaders of unquestioned authority have quite independently and with increasing frequency voiced their conviction of the vital importance of such research, and of the pressing need of more support for it; this division has found opportunities to aid men of absolutely first-rate ability, and already has a record of advance in this area which it is ready to submit, at any time, to competent and critical review. All of the arguments which led to the recommendation of this field stand today, heavily reinforced both by outside opinion and by our own practical experience. Although practical considerations may indicate certain shifts of emphasis within this field, or certain segments which should be removed or added, the division strongly reaffirms the choice of this field for the major emphasis of the division's program.

### IV - Checks and Reviews

There has certainly been too little analysis of the effectiveness of past appropriations. Studies of the effects of Foundation action should contribute basic information as to whether or not the funds are, under a given program and given administrative procedures, accomplishing important purposes. This information should:

- (a) Contribute to the training of officers
- (b) Aid the President of the Foundation in his decisions of general policy
- (c) Increase the interest and insight of the trustees, and aid them in their decisions.

- (d) Contribute, insofar as it is reflected in published reports, to sound Foundation-public relations.

It is clearly too early to judge the review procedures which are just being developed; but it is my impression that they are likely principally to serve (b) and hence (d). A considerable further burden of "paper work" is not likely, in my judgment, to contribute notably to (c), and (at least for this division) the procedure as so far suggested will not materially increase our own information, although it will insure a more systematic accumulation of that information. Project reviews could, however, be made the basis (and probably are a necessary basis) for a type of general review which, while it has its limitations and even its dangers, seems to me worth a trial. At intervals the President could, for each division, invite a small board of external advisory experts to

- (a) Receive written and/or oral reports from the director of the division in question, explaining the plan of the program in operation, the general character of trustee instruction, etc.
- (b) Receive and study the individual project reviews, together with similar report material on fellowships, grants in aid, etc.
- (c) Appraise this record and present recommendations for shifts in emphasis, in field, in character of support, etc.

This board would be purely advisory in character, and their function would be completed with the filing of their report. I am inclined to think that the directors should be asked to submit a panel of, say, ten recommendations from which the President would appoint a board of five. I doubt if this review should be carried out more often than every three years, and preferably at somewhat longer intervals.

On each individual project as it arises the officers can get and do get this sort of counsel. Indeed they can choose, as it were, an ad hoc committee of special competency for the one project in question; and they can get fuller and franker advice because it is obtained informally from one man at a time. Officers also normally have, to bear on any decision, a large amount of advice and information, obtained through office interviews and travel and recorded in diaries, which

has not been gathered in the artificial atmosphere of formal recommendations, and does not refer to the granting or not granting of a sum of money for a specific process; and which hence is more likely to reflect the adviser's true opinion of the man himself, relatively uninfluenced by personal or institutional considerations.

Thus officers have no difficulty in obtaining, on individual projects, advice that is more specially competent and useful than that which could be given by such a review board; but the board, with the total record of several years before it, should be able to give an important and useful judgment on the general development of program and on the desirability of new trends and new emphases.

Such advice should be of real service to officers, President, and trustees alike. The summary report of this committee, incidentally, would presumably be of such reasonable dimensions that the trustees could be expected to digest it.

#### V - Trustee-Officer Relations

The relationship between officers and trustees over the last five years has not, in my judgment, been characterized by a satisfactory degree of either understanding or confidence. It has been commented that the trustees used to come out of meetings rubbing their hands; but that they came out of several meetings, a year or two ago, scratching their heads. I think, and sincerely hope, that the situation has improved considerably. If the necessary ingredients for a further improvement are not present in the situation as it now exists, then these ingredients should be changed.

The trustees are very busy men, - men with large and extensive responsibilities. It is fairly clear that with a few possible exceptions they cannot take the time for a sustained consideration of details. They must direct their energies primarily to decisions of broad policy, and they must be provided with a staff of officers, to carry out details, in whom they have confidence.

It is not reasonable to suppose that each trustee understood, in a sense of detailed personal competence, all of the spectacular operations of the older days; but in those cases the presumption was easy, natural, and comforting that a project was likely to be great because it was large. But under the present type of program the officers have an uphill rather than a downhill pull; for it is almost equally natural, if one has neither the time nor special competence to consider details, to suspect that a project is trivial because it is small.

These considerations lead, in my judgment, to two conclusions. First, the trustees must be brought to see, somewhat more clearly than at present, that a high degree of concentration carries with it procedures with which they have been relatively unfamiliar, and which make upon them rather new demands. And they should not vote for concentrated programs unless they are prepared to meet these demands. This remark applies principally to NS and to H, less to MS, and least to SS. For the MS program in psychiatry was recognized at the outset as a response for the need of general development in this area, and somewhat larger moves are indicated; and the somewhat diffuse character of any program in the SS permits rather broad operations even under a concentrated program. Further it is to be noted that SS has been assigned three areas of concentration, H and MS two, and NS but one.

Second, the officers should be given a more effective opportunity to present, to the trustees, the general features of progress in the various concentrated programs. If forty minutes to an hour were available, at least once a year, at which a director could present to the trustees an integrated picture of some feature of his program, there should be a considerable dissipation of the present faintly confusing fog out of which appear for a moment, and sometimes only for a moment, isolated projects.

## VI - Interdivisional Relations

The weekly officers' conference of a year and more ago was inefficient of officers' time and somewhat unrealistic in that each was asked, at least in theory, to pass on questions concerning the projects of other divisions on which he could not possibly have competence. But these frequent meetings did accomplish certain useful purposes. Logical or illogical, wasteful or efficient, they did contribute to the unity of the organization. Officers unquestionably knew more about the plans and ideas of other divisions than they know now. There was more pooling of experience, of individual knowledge, of the institutional circumstances surrounding certain projects. I think I greeted the change from the long weekly meeting with as much relief as did any director; but a year's experience has convinced me that it is important to find some way to regain, with reasonable expenditure of time, some of the advantages of the older type of meeting.

These remarks apply to the relation between any division and all the others. The point of special interest here, (however,) is the relation between MS and NS. It is important to note that the

present questions concerning MS relations arise because of the functional nature of the present NS program. In the previous years MS was engaged in the broad development of medical schools, while the natural science activities of the boards consisted primarily of major sums for buildings, endowment, or fluid research. Such activities naturally followed the formal lines of academic organization: MS had their sole contacts with and negotiated with medical school authorities; NS similarly stayed on its side of the academic fence. But problems have no respect for or interest in the formalities of academic organization; and when one follows a functional program, interested in a certain type of problem, he either follows those problems wherever they lead him, or he confesses that he is blocked by reasons which are largely artificial and formal. Thus the psychiatry program of MS must either be permitted to go outside medical schools or it must forswear connection with all psychologists who receive their pay checks from liberal arts colleges; thus NS must be permitted to go inside medical schools, or accept the technical ruling that of two projects of essentially identical character, one is NS because Hisaw at Harvard is a professor of zoology and the other MS because Britton at Virginia is a professor of physiology. Chemistry in its relations with vital processes, - where is this to be found? It depends often on nothing more significant than the accidents of the organizational history of the institution in question. It may be in departments or subdepartments of chemistry, of zoology, or of biochemistry of the liberal arts college; it may be in departments of biochemistry, soil chemistry, etc. of the agricultural college; it may be in agricultural experiment stations or in independent research institutes of various character; and it may very well be in biochemistry, pharmacology, physiological chemistry or, indeed, in any other division of a medical school. Are we to follow the problem until we reach an imaginary organizational line and then stop, like a revenue cutter at the three mile limit?

It is, of course, true that the MS staff have an extensive and intimate knowledge of medical school problems and personnel, - but it should be humanly possible to find ways of pooling knowledge and experience. And medical men, although they are influenced by something of a guild spirit, do not exactly form an unapproachable priesthood. The NS officers have found no peculiar or strange complications to surround our occasional negotiation with medical school personnel.

So long as the NS division has a functional concentrated program it will face this question, and so long as that program places primary emphasis on basic biological problems, the significant overlap will be with MS. If there are aspects of this dilemma

which arise primarily from notions of divisional prerogatives, and of individual pride and prestige, for those aspects I have little patience. But there are aspects which have nothing to do with personal or divisional pride and credit. A division with no qualified medical personnel cannot wisely, in my judgment, have anything beyond casual and indirect relation with clinical research. This remark bears especially on possible NS interests in endocrinology, and to some lesser extent to NS interests in sex research.

To all these remarks must be joined two further facts. First, the division's experience of the last few years has made us realize that our "concentrated" program actually includes a wide area, and has also proven that there are many more important opportunities for support than we had anticipated. Second, this division is more than willing to aid in any internal readjustments which will contribute to the effectiveness of the organization as a whole. See Recommendation VIII.

#### D. PRINCIPLES & RECOMMENDATIONS

I - The problems of program and administration of the Foundation are too complex, too unpredictable, too human to be solved by formula. Policies for general guidance we must have, but the following suggestions are to be interpreted as indicating norms and trends which at present appear desirable. Any stated principles are to be violated as exceptions warrant, and are to be modified when experience indicates.

II - The Foundation should play the long game, should support with its funds the patient unspectacular search for abiding values, relatively little influenced by the superficial, even though pressing, exigencies of the moment.

III - Consideration of administrative organization and procedure does not reveal any possibilities very new or different. The

divisional setup appears definitely indicated for any program comparable with the present. Approximate divisional budgets, as an indication of trustee decision concerning relative emphasis on fields, are useful to directors, although we will need some book-keeping technique for "spreading", if large appropriations are to be made. The present exchange of paper information concerning divisional operations is not as useful an integrating force as it should be and theoretically could be. Arrangements should be devised for more extensive and unhurried discussions of directors with the President; and for more pooling of officers' ideas on matters of general interest and policy.

IV - The officers have, for some period, been both hurried and worried. We have been almost swamped with paper work, and with the necessity for restating, revamping, recasting plans. We have been too long on the defensive. The important work of the Foundation deserves a more peaceful, a more stable, a more sanely contemplative atmosphere. If staff adjustments are necessary to gain that end, those adjustments should be made.

V - The Foundation should apply in Europe, under present troubled circumstances, the same protective criteria it would use elsewhere and at other times. Although suitable opportunities will naturally be reduced by circumstances, the residuum becomes thereby of heightened general significance. It is my own belief that the Paris office, essentially as now constituted, is important and desirable.

VI - It would be highly unfortunate if there developed within the Board of Trustees small cliques acting as the almost uniform defenders of any certain program (like the previous Dixie Club on the GEB). It would be equally unfortunate to have fine projects suffer from the offhand reservations of a man who has not had opportunity to give careful consideration to all aspects of a proposal, but whose advice has very special weight because of his training and position. Thus there are real dangers, as well as the obvious advantages, to the inclusion on the Board of Trustees of experts in the special fields of program interests. It is my own belief that technical competency must, in the last analysis, rest with the officers and upon the advice which the officers can get from the scholars of the world. Thus the best possible trustees, in my judgment, are men such as Owen D. Young and J.W.Davis, of the broadest and soundest outlook on matters of general policy. If there is to be direct representation of science on the Board, I think it should be increased.

VII - I think that Board meetings should contain more "common consent" business; and that time should thus be gained for presentation, by the officers, of the general tactical features of program development.

VIII - I suggest the desirability of exploring the values to be found in reviews of the three to five-year record of each special program by specially appointed advisory boards of external experts.

IX - Granted the desirability of concentration (and with that

general principle I am in complete accord) the logically orderly thing for a division is completely to restrict its activities to clearly defined areas of special interest. Such a program simplifies administrative procedures, and gives a clear basis for satisfactory relations with the whole body of science and scientists. But I am nevertheless convinced that a wholly concentrated program is neither humanly possible nor desirable. Our trustees, however strong their theoretical enthusiasm at some particular time, will not - and quite properly will not - suffer a self-denying ordinance that keeps them from doing what they consider worthwhile. Our trustees, I am convinced, wish, and will always wish, officers to make use of the same freedom of opportunity. Our procedure may thereby be the more complicated and the less logical; but the Foundation is concerned with service, not simplicity or logic.

I think, therefore, that we have the task of thinking through, as has not yet been done, a problem which is relatively new for the Foundation. What is the honest, fair, useful, wise, practicable way of administering a combined concentrated-plus-general (or concentrated-plus-exceptional) program?

This problem cannot be solved with a phrase or with a formula. But I would urge acceptance of the principle, for this division, that the concentration be frankly admitted as one of emphasis rather than strictly one of content; and that, as a guide for averages over several years, expenditures strictly within the area of concentration

total at least two thirds of total expenditures. I would urge that the published record of the Foundation make this situation clear, so that competition for support outside of the area of concentration be as open and general as within. The steady canvassing of scientific fields outside the area of concentration is a physical and mental impossibility for the present NS staff. This indicates the desirability of possible additions to staff and/or the desirability of occasional studies and reports, by experts on temporary appointment, of certain fields outside the areas under regular and continuous examination by the permanent staff. I should suggest the desirability that further procedures be developed to secure, for items outside the areas of concentration, the desired qualities of objectivity, impersonality, and open competition. The "criterion of uniqueness" forms one such suggestion: the delaying of all general items and the selection, say once a year, of the best of the crop forms another possible suggestion.

X - It is recommended that, in the NS program\*, the emphasis be placed on modern experimental biology, including a special interest in the application to basic biological problems of the quantitative and analytical techniques of chemistry, physics, and mathematics. As exceptions to usual procedure, there will occasionally be supported projects of unusual interest and importance which are not biological in nature or in direct implication, especially when these exceptional projects occur in those

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\* The description in quotes is the sort of statement I think should be made publicly.

fields of the physical sciences from which seem most likely to come results of ultimate importance to biology." It is further suggested that:

- (a) The division continue and strengthen its emphasis on biochemistry, biophysics, genetics, radiation biology, general physiology, and experimental embryology.
- (b) The division cease to recognize a direct interest in sex research. Activities in this area include types of projects which are clinical in emphasis and should preferably be handled elsewhere, and others which are closely related with the medical division's interests in psychiatry and should be handled by them. Certain projects (classified, for example, as organic or biochemistry) with definite and perhaps direct implications for sex research would, however, continue to be supported by NS.
- (c) The division, for the same reasons and with the same understanding, cease to recognize a direct interest in endocrinology.\*

These suggestions would involve both expansion and contraction of the present NS program: some occasional expansion as regards projects of exceptional interest in the physical sciences; and some contraction, as indicated by (b) and (c) away from topics whose emphasis might be judged more medical than biological. It is expected that a program characterized by the foregoing general statement (the one in quotes) would, as it develops, include an occasional project of considerable magnitude.

Grant in aid activities would continue to play a role,

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\* This is not, unfortunately, as simple as it sounds! A serious need in endocrinological research, for example, is the close interlocking of chemistry and physiology. We would have to do the best we could, and bear with one another.

but every effort would be made to prevent small items absorbing too much time, effort, or total support. It is further suggested that:

- (d) General fellowship support be increased somewhat.

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