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SCIENCE TO RE-BUILD

MANY scientists have naturally been moved by the horrors of the war to re-examine the scope and content of their moral responsibility as men of science towards humanity. Evidence of this humane anxiety on their part is to be seen in the proceedings of the British Association which held a conference of distinguished scientists of many nationalities in London in September last.

Indeed, no scientist that has not been altogether dehumanized by scarabeeism can help admitting that the modern war (as distinguished from wars of antiquity) is a by-product—an altogether unintended one, it is true; but a by-product nevertheless—of his own workshops. Science has abolished the serene isolation of countries, complicated and queered their economic organization, kindled in them new greeds and new rivalries, and furnished deadlier weapons than were ever available before to their hands. This list of the doings of science is of course only one of the many lists possible; and the other lists are, everyone would thankfully acknowledge, as greatly gratifying as this one is grim. But can there be no helping of these dark spots? Cannot science do something to repair the damage done to life and civilization by the cupidities which its triumphs have brought into play? To think of the various social problems raised or enlarged by science and consider how she could be of service in re-building the world of man now being shattered by forces which her own progress has released, is a responsibility implicit in the influence that belongs to the scientist.

Science may claim that in herself she is non-moral and that she is not to be held responsible for the purposes for which her handiwork has been used or abused by statesman or soldier or manufacturer. To take this stand is, however, not to exalt science, but to lower her status and diminish her significance. To say that a thing is non-moral is not different from denying to it the endowment of anything like soul or conscience. Will science take it as a compliment to be counted a thing blind and heedless and mechanical? Is science to be pursued as an end in itself, or is it to subserve some other purpose connected with our life? In itself innocent, it produces things potent for mischief. Our cook is indeed a most innocent person; but the flavours he sets afloat from the kitchen will not melt away before stirring up the gastric juices of persons equally innocent moving about in the garden. There can be no transaction or occurrence within the field of man's experience,—not so much as the casual glimpse of a face or the chance hearing of a cry,—which can hope to escape registration in the ledger-book of life; and no entry can be there without its credit or debit value in terms of the psychological and character-affecting consequences of the act or the experience. Nothing, strictly viewed, is non-moral,—not even science. The scientist claims that his supreme interest is in truth. Why truth? Of what significance is it? Is it nothing more than curiosity, idle and devoid of meaning and purpose?

The scientist cannot hope to ward off blame by designating himself a simple catalyzer. If that similitude must be kept on, he is, unlike a merely chemical substance, a conscious catalyzer. He surely knows whether what he is helping to produce is medicine or munition, food or poison; and the responsibility with which the world charges him is in relation to his capacity as a human being. Must science dehumanize man? May the scientist remain unconcerned seeing the monstrous misuse of the products of his skill?

The remedy is not to exile science, but to invite more of it. Great as her conquests have been, science has yet to conquer more before her victory could be taken as completed; and these further conquests are to be achieved by her in intimate collaboration with an alert and generous humanism. The misfortune of mankind to-day is that the extent of control over external nature which science has been able to secure for man has not been equalled by the extent of control which he has been able to acquire over his own nature. Hence all the prostitution of the resources of science. Novel, adventurous, utilitarian, marketable, science has gone forward from success to success, not pausing to heed the gentle and steadying voice of the humanistic tradition in our civilization. She has preferred to see man go about hopping on one foot. Science's disregard of the older philosophy is perhaps her only unscientific act.

The universe, it is at least arguable, is a compound of the physical and the trans-physical or transcendental. But science's early successes were in the region of the physical. She penetrated far into what had previously been regarded as the mystery zone of nature and extended the frontiers of the measurable and the explainable. In the first flush of these triumphs, it looked as though there could be really no limit to

what the marching intelligence of man can unveil and capture and subdue. It followed from this that what the microscope could not reveal could not possibly exist and therefore did not exist; that reality is reality only if it could be measured by the sicentist's inch-stick. No other tests were to be trusted. The whole host of witnesses from the realms of religion and literature and art were simply out of court. Thus came about the exaltation of the physical and the materialistic and the obscuration of the transphysical and the spiritual. This was just a counter-part of the error that some of the post-Vedic faiths of India fell into, namely—the belittlement of the mundane and the exaggeration of the supra-mundane. The scales of relative value of both schools must, by the same method of reasoning that true science works by, be set down as erroneous. Our ills of to-day are the off-spring of that imperfect correlation, so to say, between the two quantities of life—a *A* and an *N*—one accessible to our analysing and proving and the other only to be "sensed" subjectively, at moments of intense inward experience and unavailable to objective proving.

The services of science to mankind may roughly be classified under three heads:—

(*i*) *Intellectual.*—Promotion of the spirit of inquiry and reasoning as against the habit of accepting opinion on trust and out of uncritical reverence for established authority; and assertion of the importance of free human striving.

(*ii*) *Life-supporting.*—The countless varieties of industrial inventions including all distance-abolishing, time-saving, labour-saving and cost-saving devices, feats of engineering, agricultural recipes, medical and surgical appliances, mechanical gadgets for comfort and convenience; indeed all the immeasurable commercial output of science and technology excepting armaments.

(*iii*) *Destructive.*—Military material of all kinds.

What has human nature made of these?

(*i*) *Unfaith.*—The habit of demanding objective proof has made men forgetful of the possibility of there being in existence a something which, while operating in their lives as truly and as effectively as anything visible and tangible, is not to be captured and treated by the apparatus and methods which have achieved such impressive successes in the physical world. So has grown a general scepticism in regard to things of the spirit and an insensibility to values other than those of utility and comfort in the world known to men. What man is able to explain is the true and what he can enjoy is the good. His intelligence and his sensation are to be the sole measurers of reality and right.

(*ii*) *Acquisitiveness.*—The industrial achievements of science have converted the whole of the varied world into a single market-place, and naked mercantilism has become its working faith. With the multiplication of inventions and concoctions multiply our tastes and cravings; and the din and bustle of the market-

fair continues to grow. What matters is profit and possession, no matter how to be acquired and at whose cost. A ruthless individualism is the rule for men and countries.

(iii) *Aggressiveness.*—"Power corrupts" said the great historian Acton. So does the consciousness of power born of the possession of well-equipped armies. Goaded on one side by the urgencies of a standard of living kept continually rising by the progress of science and technology, and tempted on the other side by the accumulating strength of new and more new weapons of war, how could nations restrain the impulse to fly at one another? Power is to be dreaded because of the temptation inherent in it. It always keeps crying to be used; and only those who have for long trained themselves in patience and self-restraint can withstand the temptation. But where is the impulsion for restraint to-day?

So has grown our world-welter. Wars there were in the ancient world; but they were born of the dynastic feuds and personal vanities of kings, not of the land-hunger and oil-thirst of whole peoples. The wars of old limited their operations to the chosen battle-fields and did not upset the economic life of whole communities or ruin the peace of the civil populations in town and village. There was some law of humanity and of honour controlling the soldier of the bygone age; his successor of to-day knows no such inhibitions. The difference in causation and in method between old-world wars and ours is the contribution—surely the undesigned contribution—of science to human affairs. Scepticism as to the reality of a principle beyond the analysable and the measurable world, mercantilism as the chief inspiration in human relations, and militarism as the sanction of claims of one against another—is it for these that science planned and worked?

Science has put idealism to flight. Mastery of the definite has eclipsed the sense of the undefined. We have left to ourselves no point of reference outside the reach of our own arm for the judging of the true and the good. Is this attitude of self-sufficiency in man scientific? Is it unscientific to postulate the existence of an entity outside Man's own self and Nature to be reckoned with—a Third Partner in the business of life, so to say?

If the old faith in the omnipotence of fate was a superstition, the new faith in the omnicompetence of human intelligence is no less so. If the old surrender to the doctrine of pre-destination was a superstition, the new confidence in the illimitability of man's conquests is no less so. And science which demolished the old superstitions should be as eager to detect and destroy the new ones. The first need of to-day is the correction of the fundamental attitude of the civilised man towards life and its concerns. The need is for that salutary spirit of humility which must come from the recognition of the possibility of a hypothesis of an immeasurable reality—a reality to be "glimpsed"—and perhaps not more than glimpsed—by what one might call the Sixth Sense,—the sense irrelevant to

objects of the physical world, the sense of what truth-seekers of another order have called the soul or the spirit. Having demonstrated the amplitude of man's latent powers, science has now got to make it clear that she has found nothing to warrant a denial of the existence, outside the realm of the physical, of a something which is ceaselessly at work,—through Nature and possibly through the instrumentality of Man himself,—to modify the operations of his power. The second half of the task of science remains to be taken in hand, and it is to help faith to find a place for herself in the life of the civilized man,—faith in the functioning of a Third Partner.

In this article, the word science has so far been used to denote exclusively the natural or physical or "exact" sciences. It is these sciences that have ruled our civilization for some decades now,—roughly since the invention of the steam engine and the railway more than a century ago. To complete the work they have accomplished on the intellectual and moral planes, they have need of the collaboration of sciences less exact—those called "social sciences"—and of non-sciences, too, which are no less valid registerings of the experiences of the human spirit in its quest after the true and the good,—those intimations of the deeper springs of life which come to us through poetry and music and the variegated story of the struggles of men and nations for improving themselves called history. Life, in all conscience, is the most serious business that man has to think of, and the veriest maximum of wisdom that he can possibly garner may not prove adequate for its purposes. But if that wisdom should be not less even by an iota than the maximum that our effort can make possible, we have need to attempt a correlation and synthesis of the fractions of knowledge and thought available from every conceivable department of the activity of man's intellect. Our attitude should be scientific; and the truly scientific attitude cannot deny recognition even to realms of being where one works by faith and faith alone. It is rational to argue that, in such realms of faith, there is always the possibility of illusion and hallucination and self-deception. Against these errors, we have some protection in the critical and checking apparatus furnished by one body of knowledge towards another. It is possible that even after all possible eliminations of error and illusion have been made by criticism, a residuum of error and illusion will remain. But that is a risk against which we are helpless and to which therefore we must prepare ourselves to be reconciled. In other words, a scientific consideration of the duty of man towards himself seems to suggest that he should learn not only to strive through a rational synthesis of knowledge to improve his condition, but also to bear manfully such failures or frustrations as all his reason and skill may not be able to avert. He needs a certain quality of resignation as much as he needs the will to constant effort. Paradoxical as it may seem, striving and resignation are both equally parts of wisdom.

Nature has implanted a paradox in the heart of man; and all conflicts in the world are its logical issue. He is both social and anti-social,—both self-centred and self-denying,—one moment obsessed with himself, another gazing at the stars and glad to

be absorbed into starlight. What science has done to him is to stimulate the egoistic in him to the neglect of the altruistic. It has tilted the balance of the soul. Restoration of the equilibrium is now the first need.

Many minds naturally have been at pains to make plans for the reconstruction of the world. These attempts have generally been in the direction of schemes for the combining of States into federations or unions. Some are suggesting an imperial federation under the hegemony of Britain, some a federation of the world under a Super-State charged with the office of securing peace and security to all nations under the sun. Various are the plans, and each has its own special recommendation. But the first stage of the approach to the problem should be through ethics and economics and not through politics. The police and the magistracy should follow, and not precede, legislation; and the legislation needed is in respect of the distribution of the goods that the world has to offer. Measuring the goods and creating the machinery for their distribution *is the task of economics*; *and enunciating* the principles of distribution is the task of ethics. Sir P. C. Ray, the doyen of Indian scientists, has spoken not only as the authentic voice of India, but also as a votary of equity and justice in world's affairs, in saying, in his letter to Sir Richard Gregory, President of the British Association, that "the question of scientific reconstruction of society on principles of freedom and justice for all should not have geographical limitations" and that "the problem of the freedom, progress and happiness of mankind is indivisible in the modern world".

A correct diagnosis is half the cure, and the first half. Sir P. C. Ray has laid the finger on the central plague-spot of the existing politico-economic structure of our civilization. The implications of his remonstrance are two: (*i*) Humans should all be treated as Humans,—not as Whites or Browns or Blacks; and (*ii*) as a corollary to this, conditions of good living should be secured to all alike. In the numerous schemes now being put forward for the reconstruction of the world, the people generally taken into account are those of the European or white races, or of States at present sovereign and self-governing. In a discussion of "equal living-space for all nations,"* for example, attention is confined to "the seventy-two self-governing States of the earth",—India and many other countries not being among them. Similarly Mr. Churchill has made it clear that the Atlantic Charter† (referred to by Sir P. C. Ray) is to apply only to "States and Nations of Europe now under Nazi yoke". As if the rest of mankind do not count! As if they have no grievances! As if their *grievances and aspirations would not matter!*

It is surely not being scientific to ignore an axiom; and the first axiom pertinent to world-planning is that the prime motive force of life is hunger; that hunger does not know black from brown and brown from white; that hunger unsatisfied is the sure beginning of insurrection. It is idle to contend that the non-white or the non-self-governing peoples of to-day are not within the pale of civilization or are on a lower

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* R R. Kuczynski (Oxford Pamphlet 8).

† The joint declaration of War Aims by the British Premier Winston Churchill and the American U. S. President F. D. Roosevelt on the 14th of August 1941.

level of it. If what is termed civilization is worth anything, they are all candidates for it. The example of the white and the self-governing is enough to convert the rest from potential into actual contestants for the world's goods. Unless the white and the self-governing are prepared to extirpate the coloured and the subjugated, they must be prepared for a conflict (as Sir P. S. Sivaswamy Aiyer pointed out the other day in a Madras speech)‡ between the "satisfied" and the "unsatisfied" of the earth, between the "haves" and the "have-nots". What then is the present planning to be for? For dispossessing a portion of the race? Then it can not possess even the merit of durability: No unscientific arrangement can stay long.

Conditions of good living are not easy to define; but they are understood easily enough even without a precise definition. The Atlantic Charter has compactly described them as "a *peace* which will afford to all nations the *means of dwelling in safety* within their own boundaries and which will afford assurance that all men in all lands may live out their lives in *freedom from fear and want*." (Of course the word "all" in the quotation is to be taken as qualified by "white", "self-governing" and "European".) A little more in detail, the conditions are a sufficiency for all of living-space and of raw materials convertible, through money, into food and clothing and shelter and other necessaries of life; free markets; facilities for education and work and recreation; leisure to attend to the deeper longings of the mind and the spirit; sense of freedom; sense of individual worth and usefulness as a unit of the human race. Who is there that does not ask for these? Those who have no appetite for any of them to-day are not to be counted upon as likely to remain sluggish for all time. Good example will tell, even upon the Asiatic and the African; and if the European and the American do not want to have trouble to-morrow, they had better realize to-day once for all that the safest course for them is the course of righteousness—treating all humans alike. Equality—the heart-string of humanism and the vital sap of democracy—is not only a principle of justice, but also one of expediency in view of the certainty of the later uprising of those who are now left ignored because of their powerlessness to make themselves heard. If planning is not to be based upon this principle, the name proper to that proceeding would be a less innocent word. A preliminary question, then, to be answered by those who will have it in their power to give effect to any plan is this—whether they are prepared to regard all human beings as human beings and as entitled to look for equal treatment to the extent practicable in the future world-organization and whether they would observe equity in the distribution of what our common mother earth has to offer her children?

The need to set up an agreed international agency, to carry out an agreed programme of measures for world peace is self-evident. What are to be the items of the programme? Many lists have been drawn up—the so-called Atlantic Charter (cited below as A.C.) being one. And here is one offered from a somewhat different point of view:—

(1) *Living-space for all.*—This includes not only the surface area of the globe,

‡ The "*Hindu*", November 17, 1941.

but also the underground resources. The A.C. has recognized the principle that all territorial settlements should be in accordance with "the freely expressed wishes of the peoples concerned". America, by an Inter-American Conference (1936) declaration, has accepted the principle that all territorial conquests should be proscribed and that "no territorial changes resulting from the use of violence are to be recognised by any government". The question is one too complicated to be solved without reference to the local history and conditions of each area. An expert body of economists, demographers and other specialists will have to furnish the necessary advice. But the general principle is that each State or political community should have enough command of the earth's space to be able to find sufficient food and occupation for all its present population and also any increase forecast as likely on the basis of census statistics. An iniquitous distribution of the first gift of nature is the root-cause of all disturbances to the peace of the world; and no settlement can last which has left a sense of unfairness in the mind of any community or nation.

(2) *Democracy Everywhere.*—The A.C. promises to "respect the right of all peoples to choose the form of government under which they will live". But this is not necessarily upholding the cause of democracy. People in the Totalitarian States of to-day are not free really to exercise their choice. It is also not unlikely that there may be a large section of the public in a country habituated to taking short-range views in preference to long-range views under the stress of war conditions; and to such people a dictatorship may appear a surer means of ensuring efficient government. Is it not the boast of the bureaucracy that its administration is more "efficient" than a democracy's can ever be? Dictatorship, oligarchy, bureaucracy, indeed any form of government by a body which is not open to the scrutiny and control of the citizen-body may be right in claiming to be more capable of efficiency than a democracy; but it is a potential exploitation-field for capitalists and armament-makers and manufacturers and money-grubbers of all kinds, and thus a breeding ground for war-microbes. It is the public at large that suffers the worst when a war is on; and therefore it is the general public that is the most interested in preventing bellicosity. The slogan during the last war was about "making the world safe for democracy". But our experience since then has shown that it is democracy that can make the world safe for humanity. To make this claim for democracy is not to count it infallible. It has weak spots like all other human institutions; and the ways of strengthening it are a big enough subject to merit a separate study. But no democracy can feel confidence about its own safety so long as there is left an autocratic or oligarchic or totalitarian or otherwise "irresponsible" government anywhere in the world; for these are the potential breeders of aggression and imperialism. No household can go to sleep in a sense of safety when there is a plague-infected street in the neighbourhood, or the presence of burglars is suspected about the town. To establish democracy everywhere is the only true way of making the world safe for democracy. But it must be admitted that many parts of the world are at the moment not fully in a condition to adopt a democratic regime; and they need time, and perhaps assistance, to prepare themselves for it. When, however, it is once definitely decided that democracy—with State socialism in some form as its programme—is to be the political ideal for all, the question of arranging help to the less prepared will be merely a matter of devising machinery. There is a precedent, but certainly no example, in the Mandates system of the League of Nations. Speaking from the standpoint of ideal perfection, one must admit that no country in the world has yet been able to reach the peak in the democratic enterprise, and that even the most advanced has still a long distance to cover. That being so, it is for no one now to question another's fitness. There is no question of racial or geographical or linguistic or other peculiarity

intrinsic to democracy; and its essential principle is one of universal human nature. All members of the human family are educable to it; and those advanced should, to be consistent with their own ideal, look upon the education of others for democracy as "a sacred trust of civilization".

(3) *Limitation of Aramaments*.—The A.C. approves of the ideal of "the abandonment of the use of force" and promises support to all "practicable measures which will lighten for peace-loving peoples the crushing burden of armament". The covenant of the League also (Art. 8) contemplated the reduction of armaments. But the League was singularly ineffective there. The control to be exercised should be not merely in respect of munitions factories, but also in respect of their laboratories. There is a very special responsibility for men of science here. They must willingly submit their researches likely to be useful for military purposes to be examined, and their reports of results to be controlled, by an international agency. When knowledge of a new death-dealing invention is made accessible to all countries alike, their rivalries in military equipment will in effect have been reduced by half.

(4) *Economic Development for All*.—Each State should be helped to ensure to all its subjects a minimal standard of earning and welfare; for, a full-fed stomach is the surest guarantor of peace. It is of course difficult to fix the datum line. Economists must help us here. It is perhaps inevitable that the contents of the minimum must vary from country to country; also that the minimum should keep rising to a higher point from year to year. The appetite grows with what it feeds upon; and the State which is indifferent or inefficient in satisfying it is a source of danger not only to itself, but also to the international body politic. In this task, therefore, a State would be entitled to look for international co-operation and help. The help should take these forms:—

(i) An international bank or financing institution to lend monev for development purposes, such loans involving no political or military or trading obligations towards any one country or State;

(ii) Supply of technical knowledge and skill and industrial machinery;

(iii) Open markets: The A.C. is grand on this point. It would "further the enjoyment by all States, great or small, victor or vanquished, of access on equal terms to trade and to the raw materials of the world which are needed for their economic prosperity". This must involve a revision of the system of tariffs, and economists should be our advisers.

It should be made both possible and obligatory for each and every State to so manage and use its resources that, while individual initiative and enterprise are encouraged, there will be no monopolistic clot in the economic life of the community and so that there will be an equitable distribution of the means of welfare throughout all classes of the population.

The doctrine of economic self-sufficiency as the goal for a country has been blamed as the inspirer of bellicose designs. That doctrine, when it assumes an extreme form, is undoubtedly unsound economics. A country's economic boundaries cannot always coincide with its geographical boundaries. Its needs are larger than its resources. Its attempts at self-sufficiency must therefore sometimes involve both waste of its own material and disturbance to some other country's prosperity. But what about economic aggrandizement which would keep other countries primitive and undeveloped so that they may remain available for exploitation as producers of raw-material and markets for finished goods? In truth, the less developed country is the bone that provokes contention among the better developed.

The A.C. is indeed gratifyingly adequate on the question of international co-operation

towards economic and social improvements. It desires "to bring about the fullest collaboration between *all* nations in the economic field, with the object of securing *for all* improved labour standards, economic advancement and social security".

A reconstructed League of Nations—reconstructed radically so that it could find more strength in its arms and more courage in its heart,—seems to be the agency for executing a programme like the one just sketched. Experience has shown us the deficiencies in its present structure and sanctions. The League should be made to include every country of the world in its membership and should be enabled to organize effective action against the recalcitrant. Developing the existing organization seems clearly a more advantageous course than trying to set up a Federal World State made up of the funded part-sovereignties of component States. The idea of such a Super-State is new and not easy to the international public; and they would naturally require time to grow familiar with it and appreciate its appeal. The way to it may be through a more vigorous working of the League. The League, faithfully supported, may itself evolve into a federal world-government in course of time.

But let us be warned never to expect to find an earthly paradise about ourselves. With the best League or the strongest World-State,—the British leading it or the Americans helping it or the whole host of the saints and sages of history inspiring and guiding it,—with all its most earnest care and its most devoted exertion,—man may still find some things not according to plan, some forces not yet amenable to reason. To be prepared for such contrarious contingencies should be part of his self-discipline.

Arnold Toynbee, one of the truest of friends the common man ever had anywhere and one gifted with a sage's insight into the problems of our age, wrote these words which, after sixty years, have lost none of their appositeness:—

"Men's rights will clash, and the reconciliation must come through a higher gospel than the gospel of rights,—the gospel of duty; that gospel which MAZZINI lived to proclaim; for not Adam Smith, not Carlyle, great as he was, but MAZZINI is the true teacher of our age ... MAZZINI was a democrat who spent his life in struggling to free his country; but he believed in liberty not as an end but as a means—a means to a purer and nobler life for the whole people. The time has come to preach this gospel."

With our best effort and best propitiation, the Third Partner,—he who puts in the element of uncertainty into our calculations, —may choose to go his own way and not ours; and then our refuge must be in a sane philosophy of cheerful fortitude and renewed endeavour.

> "To live, and bear; to hope till hope creates
> From its own wreck the thing it contemplates;
> Neither to change, nor falter, nor repent."

Conditions of peace are only partly in man's environment; partly they are within himself. If the world must give him a little, he must also be prepared to go without a little. An arduous and persistent fight for rights has given the modern man a fretful habit of mind; it has put the soul in an attitude of perpetual rebellion. That is as grave a menace to the world's peace as the external injustices he complains of. After

all, a certain degree of forbearance and resilience are indispensable if we should keep a proper sense of values and remain friends with our fellow-men. The promoting of such mental equipose and will to peace is no small part of the work for a better world-order. And that is the mission of great literature and great art. The League of Nations was most happily inspired when it set up the Committee for Intellectual Co-operation. An agency like it should,—by means of translations of great books, lecture tours of leaders of thought, local gatherings of public-spirited men and women for study and discussion,—help to bring about a better knowledge between the countries of the world of their respective cultures and civilizations, their attitudes towards life and their habits of thought. Understanding so promoted is bound to prove a strong asset to the cause of peace. Men will not then be so ready to take umbrage and fly to arms. And minds so liberated, having horizons so broadened, may be trusted to throw their weight on the side of sanity and good sense when the jingo is abroad.

The problem of permanent world-peace has for long engaged the minds of philosophers and poets. Kant dreamt of a confederation of States, and Tennyson sang for a warless world—

> When the war-drum throbbed no longer, and the battle-flags were furl'd
> In the Parliament of Man, the Federation of the World.

But scientists do not seem to be so sanguine. Some of them, at any rate, see an insurmountable obstacle in the very constitution of our hormones. Seeds of prejudice and jealousy are inextricably fixed there, and who can cast them out? The Vedic seers have taken the view that man is a mixture of good and evil, and that the disciplines of social duty and religious devotion as well as intellectual and æsthetic culture should serve to handicap the brute and give advantage to the angel in him. The sober statesman is he who, while being glad to deal with all as if they were angels, would none the less keep himself prepared to meet them even if all turned out brutes. Let us work for world-peace: but let us not behave as though it were already a fact.

In all our attempts to establish a new world-order, we should take care to keep clear of one delusion if we would avoid futility and vexation. It is given to no scientist, and to no statesman or economist or social reformer either, to turn this world of mortal men into anything to compare with the paradise of which poets and prophets of religion have spoken. The ideal portrayed by the poet and the prophet is of use but as a pointer and an incentive to effort; the disciplines which its acceptance must impose on us would be of value; the strength resulting from such disciplines is bound to be valuable: approximations towards the ideal as a result of this growth of strength must also follow in the train. Ideal therefore there must be, and effort in its direction; but with that effort the courage to face a failure and the faith for renewed effort. Man's practical wisdom can never prove sufficient for the visions of felicity granted to him. No poet's verbal ingenuity was ever equal to the nuances of his imagination; no painter's brush ever fine enough for the shades of the picture his mind has visualized. There is always an inevitable hiatus between the ideal in the mind and the accomplishment of the hand.

Such is the intractability of the material upon which the statesman (like the artist) has to work. Man's progress therefore cannot be an uninterrupted and continuous and unlimited increase of strength and felicity. It is rather the securing of the recurrence of flood-tides. Have we a sufficiency of vital energy in ourselves to feel sure of its rise after a fall of the wave? Is there sap enough in the root for the plant to survive from autumn to spring? Evaporation of water being unavoidable, is there a goodly stock in our reservoir to outlast the summer? We are then on the road of progress. So it is in a modest and chastened attitude that we should take up the task of re-building our civilization.

D. V. G.

HAFFKINE INSTITUTE

THE Annual Report of the Institute for the year 1939, records an impressive advance in all directions, particularly in the field of research. It is a matter of supreme gratification and an example worthy of emulation, that the Institute, which is burdened with the principal routine of providing large quantities of plague prophylactic and other vaccines and of carrying out diagnostic work for hospitals and private practitioners, should take upon itself the responsibility of organising a research section and achieve results of great value. These activities were generously supported by a grant of Rs. 50,000 from the Indian Research Fund Association and by the endowment of two research scholarships by the Lady Tata Memorial Trust.

Special attention should be invited to the syntheses of a series of new sulphonamide compounds undertaken by Mr. K. Ganapathi, one of the Lady Tata Scholars, in connection with chemotherapy of plague. The Director remarks, "Researches into the chemotherapy of plague have yielded very important results and beget the hope that an effective remedy for bubonic plague is within sight."

Reporting on the clinical results of these drugs, Col. Sokhey writes, "In spite of the inadequate dosage, the curative results are remarkable. Further, these sulphonamide drugs have many advantages over the serum. The drugs are administered by the mouth, are comparatively cheap to make and do not deteriorate on storage. While anti-plague serum is expensive to produce, has to be administered by the intravenous route and deteriorates very rapidly unless stored in refrigerated space. In India where plague is now almost entirely a rural problem, the sulphonamide drugs have everything in their favour. Further, and this is more important, the same drugs are equally effective in a number of other infections, such as pneumonia and blood poisoning."

Col. Sokhey continues "Synthetic organic chemistry has, during recent years, yielded compounds of the greatest value to medicine. It is certain that this particular branch of research is destined to become even more important in the near future, particularly the chemotherapy of bacterial diseases. There is a great deal of chemical talent available in India, but chemists working in isolation by themselves cannot achieve much. For worthwhile work intimate collaboration of chemists, bacteriologists and pharmacologists is essential. The Haffkine Institute is admirably suited as centre for such collaboration. It would be a great gain if a permanent department of chemotherapy is organised at the Institute." We fervently hope that Col. Sokhey's idea of a permanent department of chemotherapy will soon be realised.
