in the four evening sessions will include well-known technical men in the aircraft industry. New aircraft techniques and a projection of post-war plans will be discussed in thirty-eight papers to be read at sixteen separate meetings. The conference is under the auspices of the Southern California Section of the society. Dr. Clarence A. Dykstra, provost of the University of California at Los Angeles, will address the opening session on Monday evening, June 11.

THE "Oliver Lodge Scholarship," with a basic annual value of £250 and tenable for one year, has been founded to commemorate the twenty-fifth jubilee of the radio section of the British Institution of Electrical Engineers.

IT is reported in *The Times*, London, that the University of Bristol, which already has chairs of mechanical, civil and electrical engineering, will establish a department of aeronautics in the faculty of engineering. This development is made possible by a gift of £60,000 by the Bristol Aeroplane Company for the establishment of the Sir George White Chair of Aeronautical Engineering, named in memory of the founder and first chairman of the company, who was one of the pioneers of British aviation.

DISCUSSION

A NOTE ON DR. NOVIKOFF'S ARTICLE

HAVING myself been for a long time deeply interested in the philosophy of organism and the theory of integrative levels in its application to the sciences, the appearance of Dr. Novikoff's article in SCIENCE for March 2, 1945, during the few weeks when I happen to be in the United States on my way back to Chungking, where I direct the Sino-British Science Cooperation Office, was for me a happy coincidence. It is a great pleasure to see this philosophy gaining ground, nearly twenty years after the pioneer work of J. H. Woodger, which found its expression in his "Biological Principles" (Kegan Paul, London, 1929).

Once we adopt the general picture of the universe as a series of levels of organization and complexity, each level having unique properties of structure and behavior, which, though depending on the properties of the constituent elements, appear only when these are combined into the higher whole, we see that there are qualitatively different laws holding good at each level. The phenomena of a higher level can not be understood without knowledge of the behavior of its constituents at the lower levels. Exactly how much light the lower-level phenomena throw on the higher-level phenomena at each stage, however, will probably long remain a matter involving differences of opinion. Thus Dr. Novikoff seems to take the view (p. 213) that the behavior of the lower animals, whether solitary or in primitive association (societies?) has little relevance to the phenomena of human society, while Gerard, as well as Emerson, on the contrary, have argued that the lower animals have much to teach us about the higher human level. On this point I should be inclined to agree with Dr. Gerard, who is, I am sure, not likely to fall into what I have elsewhere called "the heresy of biologism" ("Time, the Refreshing River," Macmillan, 1944), the fascist doctrine that unending internecine strife is as much the law of human society as it is of the wild forms of animal life. It would be a pity if, in the interests of maintaining the uniqueness of the human sociological level, we were to return to an almost ecclesiastical separation of man from the rest of the living world, without the consolation of an angelic world with which he might ally himself. This would hardly be in accord with the idea of scientific socialism.

Novikoff also takes Gerard to task for speaking of a "mysteriously operating 'organizing trend'" in the universe. Mysterious it may still be to us, as it was to Anaximander or to Lucretius, but it is undoubtedly there. For me it has never been possible to describe it otherwise than as an overall continuous rise in level of organization through cosmic, biological and social evolution. Perhaps Dr. Novikoff fears that a belief in this trend might lead to inaction in the social field. The United Nations, he says, do not rely on any evolutionary fatalism, but rather on armed might, actively applied, to defeat fascism and keep humanity on the road of progress. I have always felt that a helpful reflection here is that, although the general direction of process is known, the speed at which it goes on is not known, and depends directly on the activities of each one of us, thinking willing monads of the highest level. If a thousand years of human suffering more or less depend upon our actions here and now, we need hardly fear succumbing to fatalism when we recognize a universal trend in the world process.

I would like to add once again my appreciation of Dr. Novikoff's stimulating contribution to the discussion of this fundamental subject.

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EXTRAPOLATION FROM THE BIOLOGICAL TO THE SOCIAL

IN his article in SCIENCE,[1] Novikoff cuts a wide

[1] Alex B. Novikoff, SCIENCE, 101: 2618, 209–215, 1945.