cards for dormitory rooms will be sent out with the program. Hotel reservations should be made directly with the Clinton and Ithaca Hotels.

Recent Deaths

Edward Godfrey Huber, 64, associate dean, Harvard University School of Public Health, died in Boston on 24 July. Dr. Huber had been acting dean of the School since 1942 and was named associate dean only a short time ago.

A. W. Rogers, 74, formerly director of the South African Geological Survey, died on 23 June at Capetown.

George Alfred Olson, 71, formerly of the Agricultural Experiment Station, University of Wisconsin, died on 29 July at Madison.

Clement Samuel Brimley, 82, entomologist, North Carolina Department of Agriculture, died on 23 July in Raleigh.

Arturo Posnansky, 72, leading Bolivian archeologist of old Inca ruins, died on 28 July at La Paz, Bolivia.

Rolf Nugent, 44, economist and deputy chief of supply for UNRRA, drowned near Yokohama, Japan, on 27 July, according to an announcement by UNRRA. Dr. Nugent was on leave from Russell Sage Foundation and had been in Japan only a few weeks.

Cornelius Ubbo Ariens Kappers, 68, professor of comparative anatomy of the central nervous system at Amsterdam Municipal University, died on 29 July.

Clay B. Freudenberger, 42, former acting dean of the University of Utah Medical School, died on 28 May 1946 in Salt Lake City.

J. L. Baird, 58, well known for his work in the field of television, died on 14 June in England.

Charles C. Haworth, Jr., 31, physicist, died on 28 July as a result of a fall while mountain climbing in the Selkirk Range near Golden, British Columbia. During the war Dr. Haworth worked at The Johns Hopkins Institute of Applied Physics, Silver Spring, Maryland, and since 1 March had been with the Naval Ordnance Test Station, Inyokern, California.

Wilhelm Caspari, 72, head of the Department for Cancer Research at the Institute for Experimental Therapy in Frankfort am Main from 1920 to 1936, died in 1944 in Łodz, Poland.

T. H. Laby, 66, former professor of natural philosophy, University of Melbourne, died recently in Australia.

Herbert Gastineau Earle, 64, director of the Henry Lester Institute of Medical Research, Shanghai, died at sea on 5 June after a stroke. Dr. Earle was formerly professor of physiology and dean of the Medical School at Hongkong University.

Letters to the Editor

History of a Three-color Mixer

The growth of apparatus, like the growth of ideas, is often hindered by the independent rediscovery of what has been done before. Often this is due to the description appearing in an obscure journal, and often the investigators fail to search adequately the more prominent journals.

Recently I found the same color-mixing apparatus described in three separate sources, none of which made any references to the others. The apparatus is a three-color mixer whose colors are mixed by the optical properties of two lenses. This rather ingenious device was filed with the U. S. Patent Office on 4 October 1928 by L. T. Troland (U. S. Pat. 1,971,737). The patent was assigned to the Technicolor Corporation and granted on 28 October 1934. The apparatus was again described in great detail in a manuscript by G. N. Hunter, dated 4 February 1929, which was submitted to the Royal Society of Edinburgh and published shortly thereafter (*Proc. roy. Soc. Edinb.*, 1929, 49, 232–244). The third description, by W. F. Grether, is fairly recent (*Science,* 1943, 98, 248). It too appears in some little detail.

The similarity between these three papers is striking. The methods of placing the filters, the mechanism for moving the filters, the position of the lenses, the position of the light sources, the position of the screens, the method of diffusion, and the general diagrams are almost exactly alike. Here is a remarkable example of similarity of independent invention.

JOZEF COHEN

Cornell University

Social Theory and Social Engineering

The recent article by Bateson (*Science,* 1946, **103**, 717) and the reply by Burhoe (*Science,* 1946, **104**, 62) raise issues of such importance that some further discussion

seems inevitable. Burhoe believes that the fundamental knowledge of social structure necessary to bring about peace is relatively simple and well known. Bateson feels that this is definitely not true and suspects that the simplicity is an illusion and that until the knowledge is forthcoming the social world is in mortal danger. Considerations of the following kind appear to indicate unequivocally that Bateson is correct:

(1) Naïve inspection of the earth's surface may indicate that large areas are at peace because "each person within them has the same rights and privileges as the others and may obtain what he wants by his own peaceful efforts" (Burhoe). Such inspection of, for example, the whole of Europe also should indicate that large areas have recently been at war and even now are hardly at peace because people have attempted to obtain what they wanted by war and have failed, practically everyone being worse off than before. This has happened twice in less than half a century. On both occasions the result has been essentially the same. There is a good deal of older history suggesting that only a moderate probability should be assigned to the statement that a war is a practical way to achieve economic and material ends. It is not unlikely, moreover, that if colonial or expansionist wars against technologically undeveloped regions are excluded as being (with one important exception) irrelevant to modern conditions, the probability of the thesis being correct is very low indeed. Yet the danger persists or even increases, and the geographical danger spots are still localized in regions where experience might be supposed to indicate the futility of the whole procedure. Clearly there must be other factors involved.

(2) Burhoe's remark, "by his own peaceful efforts," really begs the question and converts his argumbent into a circular one reminiscent of the *virtus dormativa* of Molière —one can have peace by being peaceful. This is to be done by the process of social engineering founded on a theory which is simple and well known but unfortunately not stated. Actually, it is reasonably certain that the values of many communities have included terms which could only be realized in warfare. If what one wants includes victims for human sacrifice, or enemies' heads, or the glory gained by rescuing distressed maidens from wicked men, then one cannot obtain these by one's own *peaceful* efforts. The examples (Aztec, New Guinea, Medieval Europe) are chosen not because they are exotic or picturesque but because they are extreme and therefore easily recognized. Their recognition immediately places on us the duty to ascertain if any of our own wants are of this kind. Moreover, the existence of such wants implies enemies who can be defeated, but if they are too thoroughly defeated, new enemies must be found to maintain the stability of the system of values. Burhoe postulates a world composed of people like himself, Bateson, and the present writer, who want primarily to continue their work peaceably. Unfortunately, there are other sorts of people, and they are not scattered at random but are aggregated into cultural groups. Bateson and the present writer, at least, would probably also consider that certain other specific values have arisen in such non-peaceful cultures which are worth preserving if it can be done without endangering the world.

(3) The factors determining the values of a culture are obviously largely unconscious, or, expressing the matter more operationally, they cannot be changed by a mere logical demonstration of their invalidity. Hence, they give rise to misunderstandings and suspicions which, when reciprocal, tend to grow by mutual stimulation unless there are mechanisms that tend to inhibit their growth. Relative to one group, the other appears unreasonable, unable to see the logical consequences, folly, and immorality of its own actions, and acquires definite psychopathic symptoms. Here we enter very difficult ground precisely because there is *no generally accepted*, inductively verified theory of such phenomena or indeed of the individual psychological phenomena which are integrated to produce the apearance of psychopathic symptoms in the behavior of a group.

(4) We are faced with three alternatives: (a) to wage a colonial expansionist war while we alone have atomic bombs, so gaining the world and losing our own souls; (b) to wait while the inevitable interaction of mutually stimulating suspicions leads through an atomic and bacteriological armaments race to an atomic and bacteriological war, causing unbelievable suffering to millions of people, destroying the material culture of a large part of our own country and of the world and with it much of the intellectual, artistic, and moral heritage dependent on that material culture; or (c) to work to find a way out of the apparent dilemma. The dilemma may prove real, but until this has been unequivocally established, the third alternative is the only one that can appeal to anyone of spirit, intelligence, and decency. If it were as theoretically easy as Burhoe believes, such people would already all be moving, perhaps too slowly, but at least in the same direction. The social engineering comes in when the direction in which we are to go is reasonably well established.

G. Evelyn Hutchinson
Osborn Zoological Laboratory, Yale University

Coordination of Cancer Research

Dr. Hammett's letter (*Science*, 1946, **103**, 714) regarding cancer research and especially his suggestion of a large-scale, coordinated research program directed toward practical benefit for the cancer patient are so important that they should not be allowed to be shelved for future consideration.

Our attitude toward the problem of malignancy has been, and continues to be, too complacent. Faced with a problem of such magnitude and complexity, we are inclined to think that its solution must await the chance discovery of some lone worker in the field at some unknown date in the future. In the meantime thousands annually die a lingering death at the hands of this killer.

Actually, this menace should be regarded in the same light as any military foe that might claim the lives of thousands of Americans before their time—that is, the situation should be considered a national emergency. This is no place to await the gradual acquisition of bits