wherever black locust is suitable, this variety is being intensively studied by members of the Department of Agriculture. It differs not only in bark, stem and flower characters from the other described varieties of this variable species, but also in the exceptional durability of its wood when in contact with the soil. The description of this variety will be published later in a circular of the U. S. Department of Agriculture under the name of *Robinia pseudoacacia* var. *rectissima*. The botanical study of this new variety was conducted by Dr. Oran Raber for the Division of Plant Exploration and Introduction, Bureau of Plant Industry.

B. Y. MORRISON

EFFECT OF RADIUM RAYS ON LIVING CELLS

IN the "Science News" department of SCIENCE for August 16, 1935, page 26, there is an item from Science Service on "The Effects of Radium on Cells." This note is based on the published work of Professor Frederick B. Flinn. The item contains these statements: "The effects of radium on living cells are always in the direction of breakdown and death; its powerful radiations, principally of alpha particles, *never act to stimulate more active growth*. . . . In no case was it found that a radioactive solution, even the weakest, was stimulative of extra growth."

In correspondence with the writer Professor Flinn confirms the correctness of this report of his results[1] and states: "My work with radium was with chicks' embryonic cells and I found no evidence of any stimulating effects in the presence of radium. This has also been confirmed by observation in the human beings and animals. These observations have been more or less confirmed by the Speer Laboratory in England. I did very little work with plants, but the work that I did do did not lead me to believe that there was any stimulating effect."

In his paper above cited from the *American Journal of Cancer,* Professor Flinn says (p. 357): "The experiments here described yielded no evidence of direct stimulation by the amounts of radium to which the cultures were exposed. . . . Plant growth has at this time been judged in a qualitative manner, but at the end of six months there was no indication of a stimulated growth."

Since the inference that radium rays "never act to stimulate more active growth" is directly opposed to conclusions based on extensive studies with plants, it is thought worth while to call the attention of others (who may be engaged in research on the physiological effects of radium rays) to these contrary conclusions, based chiefly on work with animals and man.

The writer's pioneer work is embodied in Memoirs of the New York Botanical Garden, Vol. IV, 1908. A summary, also by the writer, of work on the effects of radium rays on the life processes of plants since the discovery of radium by Madame Curie is now in press and will be published shortly under the auspices of the National Research Council.

C. STUART GAGER

BROOKLYN BOTANIC GARDEN

GERMAN BOOKS AND PERIODICALS

SUPPLEMENTING the announcement in SCIENCE of July 12, 1935, I have been informed by an official of the German government that the 25 per cent. reduction on German books, periodicals and continuations became effective beginning September 9, 1935.

Contrary to previous advice, I understand that this reduction will be granted to all foreign purchasers of German books and periodicals and not limited to libraries alone. The letter reads in part ". . . *auf das gesamte buchkaufende Publikum* im Ausland auszudehnen. . . ." The italics are mine.

CHARLES H. BROWN

IOWA STATE COLLEGE LIBRARY,
AMES, IOWA

SCIENTIFIC BOOKS

OUR REMOTE INTELLECTUAL ANCESTRY

Primitives and the Supernatural. By LUCIEN LEVY-BRÜHL. New York: E. P. Dutton & Co. Pp. 405. $5.00.

CULTURES near to our own we interpret as philosophies; older, alien, simpler ones as anthropology. They are all products of the same cerebrating organ. That insight is one of the many wisdoms of the neomoderns, ourselves.

To determine which of the extinct anthropoids is the presumptive ancestral *homo* is a matter of contentious evidence; to restore the ancestral order of *sapience* that gave him the rest of his appellation is no less so. The evidence is the reports of observant travelers, latterly of trained ethnologists, in regard to the beliefs and customs of tribes still believing and still behaving more or less according to the hypothetical prime-ancestral pattern.

To our modern critical eyes, the reconstructed physical appearance of the earliest anthropoid that could prophetically claim a place in human genealogy does not look invitingly human; and the accounts of his brutal habits and strange designs for living render

[1] *Radiology,* 23: 331–338, 1934; and *American Journal of Cancer,* 22: 351–358, 1934.

him still more suspiciously remote. Turning from the frank exhibits in the cases of natural history museums to our own reflections in the nearest convenient mirror, we are impressed by the drastic measures of anatomical improvement, plastic surgery and the attentions of "beauticians" that must have intervened to convert that picture into this. The transformation in mental complexion is even more radical; still more incredible that creatures so savage and perverse in custom, so superstitious and perverse in belief as those reported by the tomeful from all quarters and nooks where unredeemed humanity has been visited, are the ancestral representatives of the professors and scientists who write these learned books. Such, however, are the findings of cultural anthropology; on such physical and mental frameworks the evolutionary powers that be have had to build the present superbly erect and correct specimens of groomed intelligentsia to which the mirror testifies.

One section of this fascinating field, where myth and fancy, crude mentality, naked and unshamed, ogres and demons fill a crowded stage, Professor Levy-Brühl has made peculiarly his own. To "Primitive Mentality" and "The Soul of the Primitive" he now adds "Primitives and the Supernatural."

The psychological interpretation of primitive mind-ways began in the Victorian seventies, when Sir Edward Tylor, in his "Primitive Culture," introduced the concept of animism to refer to the universal habit of the primitive mind to regard all things as animated by indwelling spirit. Animism is spirit-belief. Levy-Brühl, admitting the pertinence of the approach and using "animistic" as the best available adjective to describe the attitude, basically corrected the underlying principle by calling it "psychic participation"; for "animism" is somewhat false and wholly inadequate to summarize the temper of primitive mentality. The terminology can only be a loose fit, since we who create it look through the cultural opera-glasses of our own manufacture, think in one conceptual language and the people regarded through said glasses in another. Their cultural compulsions and ours are mental light-years apart.

The validity of Levy-Brühl's diagnosis is amply attested by his rich documentation. Once the physical and the psychical are distinguished, one may formulate that the primitive mind reads the psychical into all nature, including the physical; he projects the subjective on to the objective; he animates and animizes. But, says Levy-Brühl, that is not how the matter stands in the mind of the "native." Such distinction has not yet emerged in his vague, foggy consciousness. There is no identification, since all phenomena are of one order, which is essentially what we call psychic.

Obviously, to carry on at all, our jungle ancestors had command of large collections of data. Since what they consider nature is not consistent with our views, we call that domain of thought supernatural. As best we can, we must restore the state of mind to which it was not so. We must realize that the minds of natives are otherwise oriented. What to us is vital and common-sensical is to them secondary and unconvincing. Through slow centuries of laborious education we have acquired the corrected perspective of our science. Fortunately for sympathetic understanding, the great masses of minds have not taken kindly nor wholeheartedly to the reconstruction; the "tabloid" mind is a fair stay-at-home substitute for those who can not observe at first-hand Tahitians or Esquimaux, Australian bushmen or the jungle-folk of Africa. The core of unredeemed humanity is with us yet; the caveman is no deader than superstition.

The contours of Levy-Brühl's primitive mentality make a recognizable portrait. The decisive cast of the composition is emotional. The native is affectively tense; his thinking is in the service of his feeling; and the greatest of these powerful affects that stir the savage breast is not soothing music but exciting fear. He lives in a reign of terror with an annex of a home-made inferno. Sky, storm, floods, thunder, lightning, plagues, are real enough, but the punishing, avenging forces back of them, the evil spirits, even more so—and always there is the mystic calamity, death. The idea of a natural death is beyond him; if a man dies, somebody has bewitched him. The center of activity never moves far from the pursuit of immediate existence. To some men at some time come these dire fates; others are exempt, immune, avoid them. Points of refuge in this troubled danger-zone are sought. To coax, invite, secure good fortune, to evade, deflect ill fortune: that is the to be or not to be of the pre-Adamitic Hamlet.

And his answer is an elaboration of luck ceremonials, charms, amulets, talismans, rituals of appeasement and "superstitious" wardings-off innumerable. Visible and invisible are all alike, the genius in him and the madman of a nature all compact. Every article of clothing, every act of sustenance from hunting and trapping to planting and reaping, from gathering to cooking and eating, is set in a ceremonial of fear, the avoidance of bad luck, the propitiation of good luck. It is all magic—mana and miasma—so far as effective agency goes; there is also a tincture of reflection, but mainly not his to ask the reason why, just to do or die, or do something else to avoid that fate. Yet the still small voice of connection—what in the academic alembic becomes cause and effect—will make itself heard. Observation records that this arrow has repeatedly brought down the prey—it must be lucky or blessed; that arrow has failed—a blight

hangs on it; thus there emerges a groping sense of rule in good and evil; as in survival superstition divides them into horseshoes and four-leaf clovers and picking up pins and black cats, peacock feathers and breaking mirrors. Just carry that attitude into the thousand-and-one details of your eight-hour-a-day occupation, and imagine what life would be, until you were adjudged *non compos mentis* by your employer and the authorities. If they were similarly affected, the forces of law and order which they represent would not exist.

There is a further clue to primitive mentality which Levy-Brühl calls *dispositions*. How are things, times, localities, operations, events disposed toward you? For everything is disposed to make or mar. Primitive psychology is disposology-reading intentions; and applied psychology is the wisdom of attracting favorable dispositions and avoiding, sidetracking, scapegoating unfavorable ones. The two chapters on dispositions are the richest in the book. Examples are innumerable and striking. A striking one from Tahiti is the tale of a white man spending a night in the cave of a hermit, Afaiau. His host covers him with a coat, as the night is cold, later mentions that the garment belongs to a leper. "I jumped to my feet—reached for the rum bottle—to pour it over my hands and feet for disinfection."

"Why are you so excited and worried? My only intention was to convey comfort to you when I gave you that tunic, and not to convey the disease of its former owner." Disposition determines effects.

Disposition sets the plot of a hundred dramas of the constantly dramatic primitive life. Ceremonials and dances are elaborate rituals for creating dispositions; ancestor worship is based on the same principles, making the dispositions of the dead vital for the living —lest their ghosts haunt.

But be careful as you will, disaster stalks night and day; the fear world casts spells. The cause of causes is bewitchment. Sorcerers abound; unsuspected, another or you yourself carry the Evil Eye. Punishing witches, devising counter-witchcraft becomes the great primitive practice. Moreover, try as you will not to, you will transgress, violate a taboo, and then must be applied the purification ceremonies—a Bible in their wealth of prescriptions. Between fearing, avoiding and purifying, the primitive man spent his days, entangled in the web of his own psychology. Much of this ceremonial is entirely out of the horizons of our understanding. Purification by blood produces a rich, weird and mystic magic. And so the tale goes on and on and never ends.

It is a wholesome discipline for neo-modern sophisticated, privileged, informed and clarified minds to contemplate the crude and cruel practices, the weird and bizarre products of belief, groping in bewilderment for some shelter of sanctuary in a troubled and hostile world. Such are the beginnings of our intellectual heritage. From this somehow, as mind was in the making, evolved the orderly world of orderly understanding and reasonable security. Wonderfully and fearfully made indeed is the mind of man and its employments, and equally so the story of how the rough road became a safe and speedy highway of thought.

JOSEPH JASTROW

SOCIETIES AND MEETINGS

THE SEVENTH AMERICAN SCIENTIFIC CONGRESS

UPON invitation of the organizing committee appointed by the Department of Public Education of the Republic of Mexico, the United States and its various scientific societies were invited to meet in Mexico City from September 8 to 17 to participate in the seventh American Scientific Congress. The United States Government designated the following delegates: Dr. Wallace W. Atwood; Dr. J. McKeen Cattell; Dr. Franklin S. Harris; Professor Edward V. Huntington; Neil M. Judd; France V. Scholes; Dr. Cloyd H. Marvin, *Chairman;* William W. Schott, *Secretary.*

In addition there were delegates from forty-five universities and scientific societies of the United States. Most of the delegates were appointed in response to an invitation from the Department of State extended through the American Association for the Advancement of Science.

The congress was opened at the Palace of Fine Arts, and at the first plenary session the eminent geologist, Dr. Pedro C. Sánchez, president of the organizing committee of the congress, outlined the history of past scientific congresses. His address, like those of President Cardenas and Secretary Ponton, was given in Spanish and subsequently translated into English. The following is an extract from Dr. Sánchez's address:

> The first scientific congress took place at Buenos Aires in 1898, convoked by the Hispanic-American countries, at the time of the silver jubilee of the Argentinian Scientific Society. It was said then that the isolation of Spanish America must cease, an isolation which was, in practice, worse than barbarousness: for nobody was interested in the intellectual life of the Hispanic-American