

Sándor Radó, M.D., D.P.Sc. (1890-1972)\*

## **A Critical Examination of the Concept of Bisexuality\*\***

*(Psychosomatic Medicine – Vol. II, No. 4, October 1940)*

### **Historical Survey**

Man and Woman were once a single being. This entity was cut in two by an angry god, and ever since the halves have reached toward one another in love, out of a longing to restore their original state. So the story runs in Plato's "Banquet". Traces of it have been found, however, in older sources including the Upanishads and the Old Testament, proving that Plato's fanciful conception was based upon a far more ancient myth (4, 18, 19).

This myth represents one of man's earliest intellectual approaches to the puzzle of the existence of two sexes. It offers a simple solution to this problem by creating an opposite concept, that is, the idea that man was formerly bi sexual. To the primitive mind, however, this means that he still is. Consequently the myth is curiously equivocal, and manages to convey the exact opposite of the fact that it so ingeniously explains. It is as if the myth read: "I will tell you why there are two sexes. The truth is that they are one. Properly speaking we are all bisexual."

It is clear that ancient man must have had strong motives for denying the differences between the sexes. He may have found support for his comforting solution in the occurrence of hermaphrodites. The two other elements of the myth are traceable to simple and profound human experiences. The image of violent separation is reminiscent of the event of childbirth, culminating in the cutting of the umbilical cord, while the concluding idea of a partial reunion brings to mind the pattern of the mother holding the child in her arms.

The conception of bisexuality was sanctioned by religious authority. Embodied in a system of belief, the idea had the power to eclipse the facts. Certain Egyptian gods were notoriously bisexual and Hermaphroditus, a favorite Greek god and highly popular subject for painting and sculpture, still carried an implication of deity in the Roman Empire. The advent of Christianity wiped out the religious significance of this foremost symbol of bisexuality, but the idea itself remained, to be revived in less spectacular form throughout the ages. Nor was its diffusion by any means limited to cultures touched by the heritage of the classical world. Anthropologists have found it to play a vital role in the cults, customs and folklore of primitive societies of our time, the Dutch Catholic missionary and anthropologist, J. Winthuis, even making it the title and central theme of his book "Das Zweigeschlechterwesen" (18). To what can we attribute the extraordinary range and tenacity of this myth? This question, involving as it does the history of civilization, obviously reaches beyond the province of psychoanalysis. We have, however, an experimental approach to the problem. Through the analytic study of children and neurotics we are familiar with the emotional conflicts associated with the discovery of the differences between the sexes. Since many of these reactions are elementary, it is reasonable to assume that they are also ubiquitous and that they are a part of the aboriginal matter from which the concept of bisexuality has arisen.

These scanty references may suffice to show that the idea of bisexuality far ante-dates the scientific era and owes its origin to primeval, emotional needs of animistic man. It is important to bear this in mind in our examination of the part played by the same concept in modern science.

In about the middle of the 19th century it was discovered that the urogenital systems of the two sexes derive from a common embryonic origin. The question of whether this urogenital system should be considered neutral or hermaphroditic was at first a subject of debate. When it was found to contain cellular material of both gonads (Wittich, 1853; Waldeyer, 1870) it was definitely labeled hermaphroditic (16). This unfortunate appellation of an undeveloped embryonic structure marked an historical turning point, as it opened the door to indiscriminate speculations on man's bisexuality. These speculations, resting on generalizations drawn from biological findings in lower animals, seemed to offer at last what appeared to be a scientific basis for the explanation of homosexuality and it was because of medical interest in this subject that the concept of bisexuality found its way into psychiatry. The first attempts in this direction were made by Kiernan (1884, 1888), Frank Lydston (1889, 1892), and the Frenchman Chevalier (1893). The writings of these men stimulated the Viennese psychiatrist v. Krafft-Ebing to expound the neuropsychological aspects of bisexuality in the following theory: since the peripheral part of the sexual apparatus is of bisexual predisposition, this must be true of the central part as well. Thus one must assume that the cerebrum contains male and female centers whose antagonistic action and relative strength determine the individual's sex behavior. Homosexuality results from the victory of the wrong center. v. Krafft-Ebing realized that hermaphroditic developmental abnormalities of the genitals and homosexuality are rarely associated. So he went on to the further assumption that the central part of the sex system is autonomous and therefore independently subject to developmental disturbances. Not a trace of neurological evidence was then or is now available to give credence to v. Krafft-Ebing's chain of hypotheses.

From 1896 on v. Krafft-Ebing's views on bisexuality were included in his "Psychopathia Sexualis" and thus gave the first impetus to the vogue which the concept has enjoyed even to the present time (15). Two other writers during the 1890's also contributed to its popularity: Havelock Ellis embraced the idea in his eclectic tenets, and Magnus Hirschfeld, who engaged in a lifelong defense of homosexuals against the harshness of a mediaeval law, became a devoted partisan of the concept of bisexuality (3, 9). The latter gave a new slant to the subject implicit in his view of homosexuality as an inborn characteristic brought about by a specific proportion of male and female substances in the hereditary composition of the brain. This version places the burden of proof primarily on the shoulders of geneticists, who, however, have not yet fulfilled this obligation.

In 1905 Freud published his "Contributions to the Theory of Sex" (5). Here he followed the lead of v. Krafft-Ebing in applying the notion of bisexuality to the central as well as to the peripheral part of the sex apparatus. However, he was aware of the futility of ascribing to the brain hypothetical properties and functions not yet ascertainable by neurological research, and claimed that the central manifestations of sex, i.e., psychosexuality, must be studied by psychological means. This was in line with his general attitude in regard to all the psychologically accessible functions of the brain and it was precisely for this purpose that he had evolved the method of psychoanalysis. In the desire to re-

main free and unbiased in the evaluation of his findings, Freud intentionally kept himself apart from the other medical sciences. He was obliged however to use as points of orientation a few of the basic assumptions of biology, and it was as one of these that he introduced into psychoanalysis the concept of bisexuality. This borrowed concept, formulated as a general characteristic of every human individual, came to play so important a role in psychoanalytic theory that younger men in the field dealt with it, not as a postulate or convenient frame of reference for interpretation, but as an established fact. Freud himself had no pretensions on this score: as recently as 1933 he reiterated that he had merely “carried over the notion of bisexuality into mental life” (6); he spoke significantly of “constitutional bisexuality”, and as he of course always maintained that constitutional factors were beyond the reach of psychoanalytic investigation, the phrase explicitly disclaims for psychoanalysis all responsibility as to the validity of the assumption. Psychological data alone have never been, and could not be, conclusive in this respect. If the hypothesis were abandoned in the field of biology from which it had been taken, the data accumulated by psychoanalysis would have to be reinterpreted. In any case verification rested, and quite rightly, with biology.

This state of affairs is somewhat disconcerting to a psychoanalyst, as grave doubts have arisen as to the psychological value of this concept, doubts substantiated by certain observations made in its application to medical practice. The analyst therefore has an urgent theoretical and practical motive to seek clarification of this subject, and for this he must turn to a field other than his own.

### **Sex and Bisexuality in Contemporary Biology**

We shall now glance briefly at the actual status of the idea of bisexuality in the biological field (19, 1, 14, 2, 17, 7, 8, 11). What has happened to this idea since its first appearance as a scientific generalization? On examination one finds that a truly enormous amount of relevant data has been assembled, leading to new formulations and terminology, and that as a result the old speculative notion of bisexuality is in the process of withering away. These developments are due not only to the greater body of available facts, but also to an increasingly scientific attitude, less animistic, dedicated to a finer logical precision, and coinciding with a definite shift of emphasis from the morphological to the functional point of view. This trend is clearly indicated by Frank R. Lillie in the following passages (10):

“There is no such biological entity as sex. What exists in nature is a dimorphism within species into male and female individuals, which differ in respect to contrasting characters; it is merely a name for our total impression of the differences. It is difficult to divest ourselves of the pre-scientific anthropomorphism which assigned phenomena to the control of personal agencies, and we have been particularly slow in the field of the scientific study of sex characteristics in divesting ourselves not only of the terminology but also of the influence of such ideas... Sex of the gametes and sex in bodily structure or expression are two radically different things. The failure to recognize this elementary principle is responsible for much unsound generalization.”

From the biologist we learn that sex in the gametes refers to their differentiation in form and function relevant to their reciprocal action of fertilization. In the somata, carriers of the gametes, sex refers to their differentiation in form and function relevant to or associated with 1) their reciprocal action of ensuring proper functioning of the gametes, and 2) the development of the embryo, giving birth to and caring for the child. If we put these two references together, we see that sex in its entirety refers to the differentiation in the individuals as regards their contrarelated action systems of reproduction. Taking these considerations now in reverse order, we start from the fact that in so far as concerns their reproductive action systems, individuals are of two contrarelated types. It is precisely this differentiation that constitutes the character of the sexes. Each of the two systems may be dissected into a multitude of structures, substances and functions, of which it is composed. The sex aspect of every one of these constituent parts is derived from the fact of its participation in the system as a whole.

From this definition of sex it follows that it is not permissible to single out any one element no matter how conspicuous, such as the gonad, and make it the sole criterion of sex. To attempt to determine "maleness" or "femaleness" by the relative percentage of male and female hormones in blood or urine is obviously to carry this error to an extreme. Sex can be determined only by the character of the reproductive action system as a whole. The human being is not a bundle of cells or tissues but a complex biological system, in which new system properties appear on every hierarchic level of integration. And sex is not a small bundle of cells and tissues within a larger one, but a component system of the total system: the individual. The relative significance of the various elements in each of the two sex systems has still to be established. The usual distinction between primary, accessory and secondary sex characteristics is one-sided and inconsistent, and misleading when applied in medical practice. This is a problem to be approached from different theoretical and practical angles and to which there is accordingly more than one solution.

Reproductive activity of course presupposes reproductive maturity. What then is sex, in terms of this biological conception, in the infant, the embryo, the zygote? The answer is obvious: differential development, directed toward the construction and perfection of the reproductive system. At this point, however, the picture becomes more complicated. Biologists today agree in the assumption that every zygote has the intrinsic capacity to give rise to an individual with either a male or a female reproductive system. The developmental process is shunted into one or the other direction by the successive action of determining factors such as genes and endocrine substances. It may even happen, as demonstrated in animal experiments, that the initial direction is reversed by the action of a later determinant. Also important is the fact that although by its gene composition the zygote is already earmarked for one sex, the traceable developmental process is at first identical for both sexes; and even when visible differentiation begins there may still appear two sets of discrete primordia for some parts of the genital apparatus, as if a choice of direction still remained. Thereafter, one set of primordia develops further while the other degenerates, regresses, or remains in a rudimentary state. In accord with these facts the zygote as well as the early embryonic stages are no longer referred to as bisexual, but are said, more accurately, to possess bipotentiality of differentiation. Under normal developmental conditions, as differentiation proceeds and one type of reproduc-

tive action system grows to completion, the original bipotentiality ceases to have any real significance. It is true that in some classes of mollusks, such as oysters, certain gastropoda and pteropoda, every individual has as standard equipment two complete reproductive systems, one male, one female, and actually engages in fertilization in both ways. The individuals of these species are truly hermaphroditic, i.e., bisexual in the only legitimate sense of this term. However, from the existence of species so organized nothing whatsoever may be deduced in regard to the organization of the human species or of the higher vertebrates in general. The standard developmental pattern of our species provides for each individual only one reproductive action system. The two inherent potentialities of the zygote are thereby mutually exclusive.

In humans the complicated embryological past of the reproductive system has no detectable influence on the efficient reproductive functioning of the normal individual. It can, however, play a part in disturbances of embryonic development or later in the life cycle. Embryonic differentiation of the reproductive system may be hampered by abnormally changed genes or hormonal or other factors, which foster a rival development on the part of the contrasting set of discrete primordia. The stimulation of tissues which produce hormones of the opposite sex is an important element in these disturbances. The result is anatomic malformation ranging from a marginal inconsistency in the ultimate differentiation of the sex system to a bizarre fusion and confusion of parts and characteristics of both systems. In such individuals the capacity of reproductive functioning is often hindered or lacking; they are sexually crippled, but obviously not bisexual. Derangement of a normally built sex system in later life may be observed in the female. Certain tumors of the ovarian medulla, of the adrenal cortex or of the pituitary entail an excessive output of male sex hormones that rouse the male embryonic rudiments to belated developmental activities. As in the case of embryonic malformations, this conflicting growth impedes or destroys one form of reproductive functioning while creating no new capacity to function in the opposite way. Similar changes can also be brought about artificially in animal experiments in so-called sex reversal. With or without removal of the animal's own sex hormone-producing tissues, hormones of the opposite sex are injected at various stages of embryonic development or later. Although in mammalia this has resulted only in the derangement of the established sex system, in lower species complete and successful reversal has been obtained. Partial reversal means that the individual is sexually incapacitated; in complete reversal the sex is changed but there is still only one.

To sum up this biological survey: using the term bisexuality in the only sense in which it is biologically legitimate, there is no such thing as bisexuality either in man or in any other of the higher vertebrates. In the final shaping of the normal individual, the double embryological origin of the genital system does not result in any physiological duality of reproductive functioning. This double origin is of significance only in developmental disturbances and reversals resulting in an admixture of structural characteristics of the opposite sex and thus recognisable as inconsistencies of sex differentiation. In such abnormally built individuals reproductive activity may be impaired or impossible, but the presence in their genital structure of fragments of the opposite sex does not confer upon them the reproductive capacity of that sex.

## The Problem in Psychoanalysis

Reverting to the psychological study of reproductive activity we are at once struck by the element of pleasure, a feature that necessarily eludes the physical methods of the biologist and which seems at first to lead us into another world. Must we now abandon the dictum of biology, that sex is a matter of the reproductive action system? Let us glance briefly at the decisive psychological facts. It is man's practice to engage in genital activity regardless of reproductive intent. He may even abandon any possibility of reproduction by evading in this pursuit the genital organ of the opposite sex. But how then is the pleasure yield of genital activity obtained? What is its nature? It is, of course, orgasm, a reflex effect of the reproductive action system. Having so identified genital pleasure, we see that it is precisely the orgasm element of the reproductive system that forms the basis of the genital pleasure function. Orgasm is a pivotal point, being also the point of insemination. Considering the enormous variety of man's sex practices it seems at first incredible, but on second thought quite natural, that they can all be reduced to a simple formula: in deviating from the standard pattern of genital activity man derives excitation from stimulating the sensitive spots available in his mind and body; he may even be driven to seek excitation by dramatizing himself in terms of the opposite sex; yet all this preparatory excitation culminates in genital excitation and is discharged by way of the orgasm reflex. To repeat: the common denominator in all clinical pictures of genital psychopathology is that they represent abnormal conditions of *stimulation*; yet all the stimulation derived from whatever sources, and by whatever means, acts upon a single physiological pleasure-effector, the orgasm reflex. This reflex partakes of the differentiation of the two reproductive action systems, for it involves different anatomic structures and performs different mechanical duties in each. Physiologically, genital pleasure activity in an individual with male organs is always male, and the same applies to the female. Whatever man does or fancies, it is just as impossible for him to get out of the confines of his biological sex as to get out of his skin.

At this point there of course arises the question of the extra-genital pleasure functions, discovered and explored by psychoanalysis: oral, anal, tactile, etc. These are rooted not in the reproductive system but in the alimentary or some other basic biological system. They interact and combine with one another and with the genital pleasure function to make up the individual's entire *pleasure organization*. The latter is obviously neither sexual nor nonsexual, but an entity of a new order, brought about by integration on a higher level. It undergoes typical changes during the life cycle and is characterized at every stage by a measure of functional flexibility, working in the service of one and then another of the underlying biological systems. If pathologically disturbed it of course hampers rather than benefits the utility, function of the system involved. This pleasure organization requires a term that reflects its biological nature and avoids confusion between the superior entity and its component parts. The identification of pleasure and sex made by classical psychoanalysis is at any rate biologically untenable; though originally a dynamic source of inspiration and unparalleled in popular appeal, it led eventually to hopeless confusion and doomed the psychoanalytic study of sex to scientific frustration.

Thus the biological status of the genital pleasure function, heretofore wrapped in ambiguities, is definitely established: inseparable from the reproductive action system, it is also integrated on a higher level into the pleasure organization in the individual.

This clarification was a prerequisite to any examination of the use that has been made of the concept of bisexuality in psychoanalysis. Essentially the procedure has been as follows: Certain types of behavior, or attitudes, or even mere phantasies have been interpreted in the male as “feminine,” and analogously with the female, and taken as manifestations of the individual’s “negative Oedipus complex” or “homosexual component.” Such a component has been assumed, on the basis of the concept of bisexuality, to be present in every individual. It is not pleasant to have to admit that a closer scrutiny reveals no less than six major flaws in this procedure.

1) The designation of masculine or feminine can be made with reasonable certainty only in the case of a relatively small group of phantasies referring either to the individual’s possession of one or the other type of genital equipment, or to impregnation, pregnancy or childbirth. Where no possession or reproductive use of genital equipment is implied, as is the case in the vast majority of phantasies, attitudes and types of behavior, such a designation, though perpetuated by convention and routine, has rested on purely arbitrary grounds. Freud was always aware of this stumbling-block and in 1905 suggested as the psychological definition of male or female the pursuit of active or passive goals. However in 1933 he was forced to retract this suggestion and to admit the futility of any such attempt (5, 6).

2) In diagnosing psychic manifestations as masculine or feminine no distinction has been made between adults and the youngest children, in total disregard of the differences in information and intellectual maturity. A phantasy whose content is unquestionably male or female in an adult, might in a child reflect nothing but complete ignorance or deliberate misinformation. The inheritance of knowledge and ideas, first envisaged by Plato and lately revived in psychoanalysis, must obviously be left out of consideration in the absence of any factual basis for such a claim.

3) Equally unwarranted is the idea that these so-called masculine and feminine manifestations are the direct expression of a constitutional component of the opposite sex. It is well known that phantasies draw their content from experience and therefore to a large extent reflect environmental influences, but this has been lost sight of in the field of sex. A phantasy, even though influential in attitude or behavior, may or may not be the expression of a particular constitutional component. Inspired by birds, man has dreamed for millennia of flying under his own power, but no one has ever suggested that this implied a flying component or predisposition in his constitution. It is also noteworthy that pure phantasies devoid of any driving force and behavior indicative of a strong motor urge have been considered equally representative of a constitutional component.

4) The constitutional component itself has been a subject of further ambiguity and error. In general theoretical formulations as well as in practice it is indiscriminately referred to either as a homosexual component, or as the female component in the male and the male component in the female. This is all the more remarkable as it is a matter of general knowledge that in some forms of homosexuality behavior is in no way related to the behavior pattern of the opposite sex. Obviously no knowledge is immune to the truly narcotic effect of an appealing generalization.

5) Even aside from this confusion, the term homosexual has been so stretched as to become almost meaningless. Any relationships between two individuals of the same sex, domination, submission, competitive struggle or friendly cooperation, have readily been interpreted as manifestations of “unconscious homosexuality,” regardless of whether or not they have any conscious or unconscious bearing on the patient’s sexual life. We have already seen the inconsistency and inaccuracy of the term sex as used in psychoanalysis; the term homosexuality has been even more grossly misapplied.

6) The assumption of a “homosexual” or “opposite sex” component in the constitution has not served as a challenge to discover what such a component might actually consist of, and in what specific ways, if at all, it influences man’s sexual behavior. On the contrary, it has been relied on as if it were the outcome of research which in reality has never been made or even attempted.

It should now be apparent that the vague notion of biological bisexuality, and the incredibly loose manner in which it has been used in psychoanalysis have had deplorable consequences. It has acted like a will-o’-the-wisp, always and everywhere luring our attention so that it was impossible to see where the real problem lay. And it has gravely detracted from the benefits to be derived from the unique method of research possessed by psychoanalysis. This could not but have the effect of lowering our therapeutic efficiency. The idea that he is up against a homosexual component in his constitution has often produced in a patient needless discouragement or panic, if not more serious complications.

Free from the preconception of bisexuality, we must of course take new and more reliable bearings in the field of genital psychopathology. The position outlined above on biological grounds then inevitably becomes our point of departure. The basic problem, to state it briefly, is to determine the factors that cause the individual to apply aberrant forms of stimulation to his standard genital equipment. Following up this line of inquiry, we find that the chief causal factor is the affect of anxiety, which inhibits standard stimulation and compels the “ego action system in the individual” to bring forth an altered scheme of stimulation as a “reparative adjustment” (12, 13). Both the inhibitory and the reparative processes begin far back in early childhood, leading up to the picture which we encounter in the adult. The reparative adjustment may allow the individual several alternatives of morbid stimulation, or may take the form of a rigid and inexorable pattern on which he depends for gratification. This approach, of which we can give here only the barest suggestion, has in practice unfolded a wealth of clinical details leading to a theory that is free of inconsistency and that serves as a reliable guide to treatment.

It also demands a change in outlook toward the underlying problem of constitution. If we assume, as we must, that constitutional factors may have an influence on morbid sex developments, we are now justified in considering this influence to be of two kinds: one preparing the ground for the inhibitory action of anxiety, the other modulating the course of the reparative adjustment. In considering the factors so involved we must not overlook the possibility of general, i.e., non-sexual factors, as well as innate defects of the sexual action system of as yet unknown character. It is well to recall, lest we underestimate this eventuality, that we are still in the dark even as regards the physiological mechanism of such an elementary phenomenon as sexual attraction. Still another possi-

bility is of course the presence of elements of the action system of the opposite sex such as reflexes, or rather chains of reflexes, susceptible to resuscitation by hormones or other agents (20). However, not until somatic research has disclosed such elements shall we be able to determine by psychological methods their role in shaping morbid sex behavior. Meanwhile unbiased psychological analysis can offer invaluable clues to the somatic investigator in his search for predisposing somatic factors. Any such contribution was obviously out of the question as long as we employed fictitious constitutional factors as a means of psychological explanation. This methodological error not only trapped us in a vicious circle, but also deprived somatic research of a lead not obtainable elsewhere.

In conclusion it is imperative to supplant the deceptive concept of bisexuality with a psychological theory based on firmer biological foundations. Reconstructive work of this nature is more than an invitation; it is a scientific obligation for psychoanalysis. It is also an obligation to the founder of our science, Sigmund Freud, who left us not a creed but an instrument of research.

\* *New York Psychoanalytic Institute, New York City.*

\*\* *Read at the ninety-sixth annual meeting of The American Psychiatric Association, Cincinnati, Ohio, May 20-24, 1940, before the joint session with the American Psychoanalytic Association.*

### *Bibliography*

1. ALLAN, Edgar and others: Sex and Internal Secretions. Baltimore, 1939.
2. BARD, Philip: The Hypothalamus and Sexual Behavior, in, Res. Publ. Ass. nerv. ment. Dis. Vol. XX.
3. ELLIS, Havelock: Sexual Inversion; Studies in the Psychology of Sex. Random House, New York.
4. FREUD, Sigmund: Beyond the Pleasure Principle. London, 1922.
5. FREUD, Sigmund: Three Contributions to the Theory of Sex: The Basic Writings of Sigmund Freud, The Modern Library.
6. FREUD, Sigmund: New Introductory Lectures on Psycho-Analysis, New York, 1931.
7. HARTMANN, Max: Allgemeine Biologie. Jena, 1933.
8. HARTMANN, Max: Geschlecht und Geschlechtsbestimmung im Tier- und Pflanzenreich, Berlin, 1939.
9. HIRSCHFELD, Magnus: Die Homosexualität des Mannes und des Weibes, Berlin, 1922.
10. LILLIE, Frank R. attract: General Biological Introduction; Allan, Sex and Internal Secretions. Baltimore, 1931.
11. MEISENHEIMER, Johannes: Geschlecht und Geschlechter im Tierreich. Jena, 1921.
12. RADÓ, Sándor: Developments in the Psychoanalytic Conception and Treatment of the Neuroses. Psychoanalyt. Quart., 8: 427-437, 1939.
13. RADÓ, Sndor: Lectures at the New York Psychoanalytic Institute from 1936 to 1940.
14. STEINACH, Eugen: Sex and Life. New York, 1940.
15. v. KRAFFT-EBING Richard: Psychopathia Sexualis, New York, 1931.
16. WALDEYER, Wilhelm: Eierstock und Ei. Ein Beitrag zur Anatomie und Entwicklungsgeschichte der Sexualorgane, Leipzig, 1870.
17. WEISS, Paul: Principles of Development, New York.
18. WINTHUIS, Josef.: Das Zweigeschlechterwesen. Leipzig, 1928.
19. YOUNG, Hugh Hampton: Genital Abnormalities, Hermaphroditism and Related Adrenal Diseases, Baltimore, 1937.
20. YOUNG, William C. and RUNDLETT, Brewster: The Hormonal Induction of Homosexual Behavior in the Spayed Female Guinea Pig, Psychosom. Med. I: 449-460, 1939.

*(Orthographic mistakes and incomplete first names in Bibliography edited by Adriano, Zürich, 2012)*