Piotr Wajszczyk

Lodz University of Technology, Faculty of Mechanical Engineering
Department of Manufacturing Engineering
email: piotr.wajszczyk@p.lodz.pl

The Concept of Integrity and Its Application to Engineering Ethics

Abstract

Integrity is a common and well established concept in the ethical vocabulary. It is also being used in various codes of ethics, and investigated by means of various methods. However a review of the contemporary reference literature reveals various meanings associated with this term, which is followed by its variable applicability. It is mentioned among the desirable virtues possessed by the professionals. In various Polish codes of engineering ethics there is an absence of the integrity concept, at least comprehended as fully as it is in the ethics literature. The paper contains an analysis of the meaning of integrity in English and its translations into Polish in selected codes of engineering ethics. The scopes of the used terms are compared and in result it is postulated that some initiatives be undertaken in order to clarify the discrepancies existing in various engineering codes of ethics around the professional integrity concept.

Keywords: engineering ethics, integrity, professional ethics

JEL Classification: A13

1. Introduction

It is an established tenet in ethical literature that integrity plays a fundamental role among human virtues, especially. in professional life. In order that we achieve it, we must first learn what it means to us, as engineers, economists, lawyers, nurses or other professionals. If we grasp its content and on what it depends, it will ena-

ble us to devise effective learning, training, or practicing strategies, which bring us to this end. However, the meaning of this term varies among researchers and research fields across disciplines. The paper depicts some of these meanings and, by means of the cited literature of integrity, attempts to relate this term to other human virtues established in the course of research. The following sections review these various meanings of integrity with an attempt to synthesize them and draw conclusions for further research. The second section analyses popular notions of integrity in various sources of reference. Sections three, four and five are devoted to professional integrity applied in engineering.

2. The possible meanings of integrity

The content of 'integrity' is defined either by a definitive statement, in a broad popular sense, or in narrower sense, by its outcomes. The latter will be considered in a separate paper.

According to *Merriam-Webster's Unabridged Dictionary* (2000) the English term *integrity* is derived from the Latin *integritas* and *integer*, which mean, i.a., entire, untouched state of a thing[1]. Its first meaning of soundness is applied to personality, health, structural functioning (of brain, currency system or aircraft), whereas the second facet is focused on the 1st 'uncompromising adherence to a code of moral, artistic or other values, utter sincerity, candor, avoidance of deception, expediency, artificiality, or shallowness of any kind (physical vigor, business integrity and thrift)'. When someone is said to be of *integrity*, it is implied he has a duty towards his opinions and behaviours expressed and revealed. The alternative meaning of this entry is 2nd 'the quality or state of being complete or undivided [in terms of] material, spiritual, or aesthetic wholeness: organic unity: entireness, completeness'. This sense of integrity is applied to a range of objects, from an empire, persons, poems, ideas or aesthetic experiences.

Another and even more comprehensive source of reference, *Roget's International Thesaurus* classifies this term in eight discriminated possible fields of meaning (despite some overlap): (1) *artlessness* (a. ingenuousness, b. guilelessness; c. simplicity; d. unsophistication; e. innocence; f. openness; g. candor); (2) *probity* (a. honesty; b. rectitude; c. uprightness; d. righteousness; e. goodness; f. decency; g. honor; h. (good) character; i. fairness); (3) *wholeness* (a. whole, b. totality; c. entirety; d. unity; e. wholeness); (4) *completeness* (a. totality; b. wholeness; entireness; c. entirety; d. unity; f. thoroughness); (5) *simplicity* (a. purity; b. plainness; c. unadulteration; d. singleness); (6) *particularity* (a. individuality; b. singularity; c. differentiation; d. personality; e. selfness; f. egohood; g. nonconformity; h. individualism); (7) *oneness* (a. unity; b. singleness; c. individuality; d. particularity; e. uniqueness; f. unification; g. solidification; h. indivisibility; i. wholeness); (8) *soundness* (a. intactness; b. wholeness; fullness)[2].

---

[1] *Merriam-Webster's Unabridged Dictionary*, 2000.
[2] *Roget's International Thesaurus*, 7th ed., Harper Collins Publ. 2010.

These two reference sources offer possibly the most comprehensive scope of applicability for the term to designate qualities of various objects in the English language. Although they use different classification approaches, they generally converge on the common denominator for integrity, perhaps with the exception of the 6th meaning of the latter source of reference ('particularity'). Other sources of reference: *Concise Oxford English Dictionary*[3], *Collins Cobuild English Dictionary*[4], and *Longman Dictionary of American English*[5] give one or two of the above mentioned fields of meaning (*Merriam-Webster's* 1st and 2nd).

This foreign term is usually used more narrowly in the Polish language to denote mostly two meanings. One of them is indivisibility and wholeness (*integralność*) of an object referred to[6], usually data, body, the state or its territory. Alternatively it is translated into honesty (*uczciwość*, *prawość*), whenever referred to an engineer, businessperson, trader, or a manager[7]. There are therefore many marked differences in the meaning of this term used in English and its corresponding uses in Polish or in translations into Polish. The English term inherently contains a positive, healthy aspect in the term integrity, whereas its Polish counterpart, *integralność*, merely conveys either the meaning of wholeness or unity without such a normatively positive 'colouring'.

3. Integrity – the aim of professional engineering and scientific moral practice

One of the popular textbooks[8] used for engineering ethics teaching in the United States mentions integrity as one of the learning outcomes at the end of the ordered list. It is the last one (tenth) after moral awareness, cogent moral reasoning, moral coherence, moral imagination, and moral communication (the so called direct goals in college courses, which centre on cognitive skills – skills of the intellect in thinking clearly and cogently). They are followed by moral reasonableness, respect for persons, tolerance of diversity, and moral hope (which specify aspects of moral commitment and responsible conduct). Integrity is considered there as the most comprehensive and the most difficult to obtain and maintain of the professional outcomes in the course of the whole ethical education and lifelong practice.

---

[3] *Concise Oxford English Dictionary*, 11th ed., Oxford University Press, Oxford 2004.

[4] *Collins Cobuild English Dictionary*, 4th ed., Harper Collins Publ. 2003.

[5] *Longman Dictionary of American English*, 4th ed., Pearson Education 2009.

[6] *Wielki słownik wyrazów obcych PWN*, ed. M. Bańko, Wydawnictwo Naukowe PWN, Warsaw 2005, p. 551.

[7] *Słownik terminologii prawniczej i ekonomicznej angielsko-polski*, eds. J. Jaślan, H. Jaślan, Wiedza Powszechna, Warsaw 1991, p. 335; *Słownik naukowo-techniczny angielsko-polski*, eds. M. Skrzyńska, S. Czerni, T. Jaworska, E. Romkowska, Wydawnictwa Naukowo-Techniczne, Warsaw 1982, p. 407; Stanisławski J., K. Billip, Z. Chociłowska, *Podręczny słownik angielsko-polski*, Wiedza Powszechna, Warsaw 1983, p. 373.

[8] M.W. Martin, R. Schinzinger, *Introduction to Engineering Ethics*, McGraw Hill International Edition, New York 2010, p. 11.

This goal is defined there as 'maintaining moral integrity and integrating one's professional life and personal convictions'[9]. Its importance is especially visible among senior engineer decision makers who decide on, manage and evaluate complex and remarkable investment projects, or become involved in public or government management, since 'morally admirable engineers (…) accept their obligations and are conscientious in meeting them. They diligently try to do the right thing, and they largely succeed in doing so, even under difficult circumstances. In this sense, being responsible is a virtue – an excellence of character'[10]. Integrity is one of the most fundamental virtues, and accounted to the *self-governance virtues* which are necessary in exercising moral responsibility. Among these virtues we can find those which centre on moral understanding and perception: e.g., self-understanding and good moral judgment. Aristotle calls them practical wisdom (*phronesis*, φρόνεσις)[11]. They are necessary for any ethical professional practice. This will require the combined grasp of particulars: astuteness, perception, and understanding, making up *phronesis*, which direct a person toward the right action. Second, Aristotle treats them as practical (but not moral) virtues, which become good only when exercised as a part of good professional practice based on prior consideration of what is good for a man or society[12]. St. Thomas Aquinas, his great proponent, called the practical wisdom *prudence* and determined it to be a composite of virtues: εὐβουλία, σύνεσις, and γνώμη. The first of them denotes a habit whereby we take good counsel, the second denotes the excellence of judgment related to common law, and the third – refers to the excellence of judgment according to the natural law[13]. Other self-governance virtues such as courage, self-discipline, perseverance, conscientiousness, fidelity to commitments, and self-respect, centre on commitment and on putting understanding into action. It appears clear then that the integrity of a person should always be associated with good acts. The possibilities of combining vices with virtues, or within virtues, should always be avoided as far as possible. The more they should be dissuaded, the more instances appear in ethical literature, which indicate that authors try to ascribe some components of integrity to deeply immoral individuals like Adolph Hitler or Bernard Madoff. In these cases coherence of words with actions or some acceptable external conduct do not imply by default the underlying personal virtue – integrity. There are examples of professional engineers (like Roger Boisjoly), who attained a high level of integrity and showed its applicability in life staking circumstances.

---

[9] Ibidem.

[10] Ibidem, p. 17.

[11] Aristotle, *Nicomachean Ethics,* Cambridge Texts in the History of Philosophy, translated and edited by R. Crisp, Cambridge University Press, Cambridge 2004, Book VI, Ch. 5, p. 107.

[12] 'Practical wisdom, then, must be a true state involving reason, concerned with action in relation to human goods. Moreover, while there is a virtue in skill, there is none in practical wisdom. In skill the person who misses the mark voluntarily is preferable, but with practical wisdom, as with the virtues, the reverse is true. Clearly, then, practical wisdom is a virtue and not a skill'. Ibidem*,* p. 108.
It cannot be then a substantive moral virtue, always good in itself, such as honesty, beneficence, σοφία, and νους are.

[13] St. Thomas Aquinas, *Summa Theologica*, literally translated by the Fathers of the English Dominican province, Burns Oates & Washbourne Ltd., London 1921, Ia IIæ, q. 57 a. 6.

Integrity in science and engineering has for long time been used mostly for denoting acts opposed to scientific misconduct, rather than for exposing a model or paragon of professional practices, be it individual, organizational or social. For example the scientific misconduct triumvirate, *fabrication*, *falsification* of scientific findings, and *plagiarism* (FFP), has been analysed in the professional ethics literature and denounced as opposed to integrity in science and engineering. According to a definition of FFP, these practices comprise '(…) misappropriation, interference in scientific research activities and misrepresentation as the principle aspects of scientific misconduct. The notion of misappropriation includes not only plagiarism but also the misuse of information obtained through the confidential review process (…) omission of relevant findings or information that, as an intended or foreseeable consequence, results in deception'[14].

This facet of compromised integrity in science and engineering is covered by instances of methodology shortcomings, both in a form of wrong research design, superficial (but cheaper) experimental conduct of tests, or compromised data processing and evaluation. These intended or negligently allowed instances of research behaviour result in low quality or completely falsified research results. One of the possible remedies are multiple checks and controls at various stages of the research process, but even despite them the research may still fall short of the desired outcomes. This is due to the increased competition among research groups, and individual researchers, whereby the competing interests may have intentional or unintentional adverse impact on how results are influenced, gathered, interpreted and presented. The competition may also have an influence on the evaluation of a competing research work, even without overtly known credentials on this evaluated work (peer review process). In the highly specialized areas there may by few experts who are capable of competent evaluations of one another, therefore they know one other, even in the double blind refereed reviews. This is especially problematic in case of competition for funding or patents and requires particularly high moral standards and integrity from the reviewers.

Other spheres of compromised integrity are represented by the lack of integrity in information provision to and from the society and the environment. These cases take the form of misleading advertising, false or malicious gossip against competitor, researcher or their group, disclosure of proprietary, confidential information, and acceptance and use of projects without the consent of the authors or proprietors. Unauthorized access to, or dual use of, certain proprietary information and works both physical and intellectual also pose a problem to the maintenance of integrity.

Recently, however, there has been a notable shift from the negative meaning of what integrity does not mean to what integrity actually is in the professional ethics literature. Authors agree that it 'generally means maintaining high moral

---

[14] *Science and Technology Ethics*, ed. R.E. Spier, Routledge: Taylor & Francis Group, London, New York 2002, p. 30 n.

standards and doing superior work in a professional capacity, as opposed to merely avoiding misconduct'[15].

4. *Integrity* – the moral end in various codes of engineering ethics

It is a general rule, that all of the international codes of engineering ethics contain, use and require from their members the highest standards of integrity. In this context the term is used in the meaning of soundness of values, honesty and adherence to uncompromised conduct procedures[16]. It is worth noting here that the NSPE code singles out *honesty* from *integrity* explicitly, which implies the meaning of the latter as different from honesty itself, although equally important.

When we come to Polish translations of international codes, we encounter the ambiguities mentioned in the first paragraph of this paper. The FEANI-NOT Code of Ethics can serve here as a good example[17]. In the section of personal ethics its explicit Polish translation mentions the *professional integrity* (*integralność zawodowa*) related to professional conduct, which sounds somewhat awkward in this context. As shown in the previous paragraph the term *integrity* is used both in relation to personal values: soundness, honesty, individualism, candour or nonconformity as well as being applicable to abstract objects, non-personal beings or procedures. In contrast, the corresponding meaning of this term in Polish (*integralność*) suggests merely the *wholeness* or *unity* of professional conduct. This difficulty in translation, and resultant ambiguity, pose a great difficulty to the proper understanding of what actually is required in the FEANI code, and consequently, what should be observed by members of the profession.

The corresponding terms, which contain or directly refer to *integrity,* have been used in other Polish codes of engineering ethics with various meanings.[18]

---

[15] T. Iseda, *How Should We Foster the Professional Integrity of Engineers in Japan? A Pride-Based Approach,* "Science & Engineering Ethics" 2008, vol. 14, No. 2, p. 166.

[16] According to the Preamble of the National Society of Professional Engineers (NSPE) Code of Ethics (rev. 2005): 'Engineering is an important and learned profession. As members of this profession, engineers are expected to exhibit the highest standards of honesty and integrity'. In Code of ethics (1997) by Accreditation Board for Engineering and Technology (ABET) Fundamental Canons: '(…) 6. Engineers shall act in such a manner as to uphold and enhance the honor, integrity and dignity of the profession' and '(…) Suggested Guidelines, art. 3e: Engineers shall be dignified and modest in explaining their work and merit, and will avoid any act tending to promote their own interests at the expense of the integrity, honor and dignity of the profession'. While in IEEE Code of Ethics (2006): 'Article I (…) 5. Advance the integrity and prestige of the engineering profession by practicing in a dignified manner and for adequate compensation'. [emphasis added].

[17] Kodeks FEANI-NOT: '1. Etyka osobista: (…) Jego integralność zawodowa oraz uczciwość intelektualna gwarantują obiektywność analiz, ocen, jak również podejmowanie konsekwentnych decyzji'. In English this corresponding sentence is the following: 'His professional integrity and intellectual honesty shall be the guarantees of his impartiality of analysis, judgment and consequent decision'. In the author's opinion the translation of this sentence which reflects better sense of integrity used in this context should be following: 'Jego integralność i wzorowość zawodowa oraz uczciwość intelektualna będą gwarancjami bezstronności analiz, ocen i wynikających z nich decyzji'. [emphasis added].

[18] Examples of Polish codes of engineering ethics: SIDiR: '1. (…) Członkowie tej grupy zawodowej, (…) starają się oferować usługi zgodnie z zasadami moralnymi i cywilizacyjnymi opartymi o uczci-

They most often use synonyms (*honesty*), which narrow down the original meaning of the term, and not cover fully its original sense, discussed in previous paragraphs. Specifically, these phrases lack an explicit use of *integrity* in its meaning of individualism, identity, purity, soundness, correctness, unadulterated and uncorrupted state of a thing, exemplary procedure, behaviour, or attitude. Of course, such use of the term *integrity* implicitly assumes the existence of a model, ideal or paragon of such a desired object. This assumption is most often substantiated, as the very codes refer to some pre-existing models of conduct specified in other documents and sources, and impose norms of their observance. Any deviation from such a model may become indicative of norm violation and compromised integrity. The codes of ethics must agree in scope and content, otherwise either the scope or content of regulations, or both, will not overlap. Thereby, in fact, these codes, the original and their Polish accepted translations, are not comparable in their actual professional obligations imposed on the professional society members, at least in this particular aspect, in terms of the attainment of the *professional* or *personal integrity*. However, it is important that a reader of a code of ethics has a clear and exact meaning of the terms that impose moral obligation on professional conduct, be they in English or in Polish. It is all the more imperative, as the codes are norm-setting documents: they do not provide information on what the norms actually are in the community, but on what they should be.

Engineering organizations report their repeated efforts to maintain the organizational focus on the professional integrity issue, as they find it to be the key component of success, along with quality and sustainability.[19] They found that corruption, the opposite of integrity – at least comprehended as the synonym of honesty – is positively associated with a demand for corruption, the supply of corruption, and the condoning side of it, which silently accepts its existence but does nothing to prevent it.

5. The meaning of integrity in engineering practice

The article proposes the complementary term of '*wzorowość*' (exemplarity) be used in translation of *integrity* into Polish in various codes of ethics. There are

---

wość, bezstronność, słuszność i sprawiedliwość. (…) 5. Inżynier konsultant wydaje oświadczenia publiczne w sposób obiektywny, uczciwy, prawdziwy'. Kodeks etyki Polskiej Izby Inżynierów Budownictwa (PIIB): '(…) 2. Inżynier a społeczeństwo: W swej działalności inżynier kieruje się dobrem publicznym oraz zasadami uczciwości zawodowej i osobistej'. Kodeks Zasad Etyki Zawodowej Urbanisty: 'Rozdział II: Obowiązki urbanisty wobec kraju i społeczeństwa: 1. Urbanista w swojej działalności zawodowej powinien kierować się porządkiem prawnym Rzeczypospolitej Polskiej, uczciwością i obiektywizmem. (…) Rozdział V: Obowiązki urbanisty wobec innych urbanistów (…) 2. Urbanista powinien przestrzegać wobec innych urbanistów zasad koleżeństwa, uczciwości i lojalności'. Kodeks Polskiego Związku Inżynierów i Techników Budownictwa: 'Rozdział II: Inżynier a społeczeństwo: W swej działalności inżynier kieruje się dobrem publicznym, zaś w swoim postępowaniu zawodowym zasadami uczciwości. (…)'.

[19] J.M. Boyd, J.D. Padilla, *FIDIC and Integrity: A Status Report*, "Leadership and Management in Engineering" 2009, vol. 9, No. 3, pp. 125-128, http://dx.doi.org/10.1061/(ASCE)1532-6748(2009)9:3 (125), p. 125.

several arguments in favour of the use of the above term. First, it is important that in case of any international research the concepts have their full coverage of content correspondence of terms in a given language. Second, the code must be understandable by the engineers without any doubts. Otherwise misunderstanding or doubts would either add to their attitude of indifference toward the code or produce doubtful professional conscience or wrongful practices. Third, integrity is a virtue, although adjunctive, not substantive[20], yet it has strong bonds with exemplarity used in virtue ethics. Fourth, the professional norms of behaviour are commonplace in engineering practice, and so they should be well easily comprehensible in terms of the exemplary behaviours referred to in the codes of ethics. Fifth, it is crucial in the codes to describe the desired professional conduct in terms of the virtues, exemplary attitudes and integration of them, rather than integration of any attitudes or any traits of character. The latter case might have taken place had the notion of integrity had not its 'healthy' and 'exemplary' connotations in translations. Eventually, the integrity concept is measurable: the exemplarity, both eidetic and teleological[21], is more easily conceivable and any departure from it would be more easily reported than the departure from the process of integrating. It can also be treated in a broader sense regardless of any particular moral theory, as suggested by Audi and Murphy[22].

There are also some other reservations: its translation into *integralność* is derived directly from the etymological root and conveys the ambiguous possibility of integrating both virtues and vices. Additionally, the term emphasizes the need to integrate one's personality, and stresses dynamism rather than static reliance on some exemplary ideals. If it remains in use though, it can be explained in commentary to the code, provided that it is possible and there is space given for it.

Integrity for an engineer should reflect above all the various facets of his professional responsibilities. Some authors replace *research integrity* with two notions: *epistemic integrity*[23], a notion which focuses on the reliability of the results of research, and a moral notion of integrity, which concerns the moral acceptability of research practices. The first one is still confined only to the epistemology of science (natural), not necessarily to other epistemologies. The authors, having considered various definitions of integrity, offer their own: '[they] define the epistemic integrity of a practice as a function of the degree to which the statements resulting from this practice are deceptive. The more deceptive these statements, the lower the epistemic integrity of the practice'.[24] Additionally, the results are confined mostly to biomedical research, and the authors do not resort to other categorical dimensions which determine and explain the core concept. Its brevity is achieved by using only the degree of deceptiveness of statements or behaviours resulting in research practice.

---

[20] R. Audi, P.E. Murphy, *The Many Faces of Integrity*, "Business Ethics Quarterly" 2006, vol. 16, No. 1, pp. 3-21.
[21] T. Ślipko, *Zarys etyki ogólnej*, Wydawnictwo WAM, Cracow 2004, p. 210.
[22] R. Audi, P.E. Murphy, op. cit.
[23] J. De Winter, L. Kosolosky, *The Epistemic Integrity of Scientific Research*, "Science & Engineering Ethics" 2013, vol. 19, No. 3, pp. 757-774. doi: 10.1007/s11948-012-9394-3.
[24] Ibidem, p. 761.

6. Conclusions

The above discussion was intended to clarify some of the discrepancies of integrity existing in various editions and translations of codes of engineering ethics, both Polish and international. The differences may appear to be quite voluminous in content and meaning, if we consider the systematic reductions in the meaning of the term, which often used to be the case in routine translations. These portions of the lost content may later have an adverse effect on the desirable professional conduct, which will gradually disappear from the professional practice. It is imperative then that the proper integral meaning of this valid and fundamental term be maintained and reflected in further editions of the professional codes. It is equally important that they be conscientiously applied by the professional society members, with full understanding of the adverse effects in case of any negligence.

Two broad approaches are notable in the integrity literature: one prevailing in the social sciences, which relates the term to human virtues as its components, and uses interview methods for determining their content, influence on behaviour, etc. The other approach applied in the natural sciences assumes the existence of one truth, and the deviation from it becomes a measure of deception – an opposite to integrity. These two approaches provide complementary views on the reality: the applicability of integrity in various professional and non-professional environments. They offer deeper, sociological and psychological insights into ethical analyses.

The article proposes the use of a synonym of integrity, when translated into Polish – *wzorowość* (exemplarity), because it makes up for the shortcoming in the content of the sole use of *integralność* discussed above.

Future integrity measures applied to science and engineering communities should comprise both aspects of negative behaviours and attitudes as described above as well as positive ones specific to this professional community. An attempt should be made to integrate the meaning of the term across social and natural sciences, so as to arrive at a synthetic notion of integrity applicable to the wider population of professional individuals.

References

Accreditation Board for Engineering and Technology (ABET) Code of ethics, 1997.

Aristotle, *Nicomachean Ethics*, Cambridge Texts in the History of Philosophy, translated and edited by R. Crisp, Cambridge University Press 2004.

Audi R., P.E. Murphy, *The Many Faces of Integrity*, "Business Ethics Quarterly" 2006, vol. 16, No. 1, pp. 3-21.

Boyd J.M., J.D. Padilla, *FIDIC and Integrity: A Status Report*, "Leadership and Management in Engineering" 2009, vol. 9, No. 3, pp. 125-128, http://dx.doi.org/10.1061/(ASCE)1532-6748(2009)9:3(125).

Collins Cobuild English Dictionary, 4th ed., Harper Collins Publ. 2003.

Concise Oxford English Dictionary, 11th ed., Oxford University Press 2004.

De Winter J., L. Kosolosky, *The Epistemic Integrity of Scientific Research*, "Science & Engineering Ethics" 2013, vol. 19, No. 3, pp. 757-774. doi: 10.1007/s11948-012-9394-3.

IEEE Code of Ethics, 2006.

Iseda T., *How Should We Foster the Professional Integrity of Engineers in Japan? A Pride-Based Approach,* "Science & Engineering Ethics" 2008, vol. 14, No. 2, pp. 165-176.

Kodeks etyczny Polskiej Izby Inżynierów Budownictwa (PIIB), 2007.

Kodeks FEANI-NOT (www.not.org.pl), 2008.

Kodeks Polskiego Związku Inżynierów i Techników Budownictwa, 2011.

Kodeks Stowarzyszenia Inżynierów Doradców i Rzeczoznawców, 2010.

Kodeks Zasad Etyki Zawodowej Urbanisty, 2006.

Longman Dictionary of American English, 4th ed., Pearson Education Limited 2009.

Martin M.W., R. Schinzinger, *Introduction to Engineering Ethics*, McGraw Hill International Edition, New York 2010.

Merriam-Webster's Unabridged Dictionary, Merriam-Webster, Inc., 2000.

National Society of Professional Engineers (NSPE) Code of Ethics (rev.) 2005.

Roget's International Thesaurus, 7th ed., Harper Collins Publ. 2010.

Science and Technology Ethics, ed. R.E. Spier, Routledge: Taylor & Francis Group, London, New York 2002.

Ślipko T., *Zarys etyki ogólnej*, Wydawnictwo WAM, Cracow 2004.

Słownik naukowo-techniczny angielsko-polski, eds. M. Skrzyńska, S. Czerni, T. Jaworska, E. Romkowska, Wydawnictwa Naukowo-Techniczne, Warsaw 1982.

Słownik terminologii prawniczej i ekonomicznej angielsko-polski, eds. J. Jaślan, H. Jaślan, Wiedza Powszechna, Warsaw 1991.

St. Thomas Aquinas, *Summa Theologica,* literally translated by the Fathers of the English Dominican province, Burns Oates & Washbourne Ltd., London 1921.

Stanisławski J., K. Billip, Z. Chociłowska, *Podręczny słownik angielsko-polski*, Wiedza Powszechna, Warsaw 1983.

Wielki słownik wyrazów obcych PWN, ed. M. Bańko, Wydawnictwo Naukowe PWN, Warsaw 2005.